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Authors:

Satu KAJANDER-UNKURI, RN, PhD, post doc researcher, Department of Nursing Science, University of Turku, Finland; Diaconia University of Applied Sciences. ORCID: 0000-0003-2668-5856

Pauliina KÄMÄRÄINEN, RN, Master's Student, development coordinator, Department of Nursing Science, University of Eastern Finland, Kuopio, Social and Health Services, City of Kuopio, Finland

Tuula HARTIKAINEN, RN, MNSc, Service Superior, Social and Health Services, City of Kuopio, Finland

Riitta TURJAMAA, RN, PhD, post doc researcher, Department of Nursing Science, University of Eastern Finland, Finland; Savonia University of Applied Sciences. ORCID: 0000-0003-2053-3237

Corresponding author: Riitta Turjamaa

Savonia University of Applied Sciences, Unit of Health Care Kuopio

Microkatu 1, Technopolis

70201 Kuopio, Finland

email: riitta.turjamaa@savonia.fi

phone: +358 40 5627 856

ORCID: The Journal requires the submitting author to provide an ORCID: Riitta Turjamaa 0000-0003-2053-3237

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ABSTRACT

Home-care professionals need competences to ensure that they evaluate their older peoples' health conditions, especially in acute care situations. This study aims to investigate the effectiveness of combined web-based and simulation-based continuing education on home-care professionals' competence regarding evaluating older people's needs for acute care. A quasi-experimental pretest-posttest study was conducted with home-care professionals who were working in older people's care in Finland. Home-care professionals (N=254) had participated in combined web-based and simulation-based continuing education in 2017-2019. Data were collected using a questionnaire developed for this study before (n=171) and after (n=83) the education. The data were analysed statistically. The mean competence score was 3.22 ± 0.51 before the education and 3.92 ± 0.57 after the education. Improvements were detected in overall competence and in all eight subscales. Improvements were highest in health assessment and consultation and the lowest in type 2 diabetes, but this was already the highest level of self-assessed competence in the pretest assessment. The combined web-based and simulation-based continuing education was effective in increasing the home-care professionals' competence in evaluating older people's needs for acute care. Evaluating older people's needs for acute care should be embedded in curricula and continuing education programmes.

KEYWORDS: competence, home-care professionals, older people's care, continuing education, self-assessment

What is known about this topic?

- Home-care professionals need to develop their competence in older people's care.
- Home-care professionals' competence in evaluating older people's health conditions in acute care situations have a positive impact on older people's well-being and their ability to continue to live in their own home.

What this paper adds?

- Combined web-based and simulation-based education increase home-care professionals' competence and could be used for continuing education, which is a significant area for home-care professionals working in older people's care.
- It is essential that evaluating older people's needs for acute care is embedded in curricula and continuing education programmes.

More research on the effectiveness of combined web-based and simulation-based continuing education is needed to improve home-care professionals' competence in gerontological settings.

1 INTRODUCTION

Life expectancy is increasing in most countries and older people are living longer and they want to stay in their familiar home environment as long as possible (Eurostat, 2020; de Bruin et al., 2018). At the same time, the increasing burden of chronic illness, due to the ageing global population, poses a significant challenge for home-care professionals (OECD/EU 2020; Sherman et al., 2012). This paper uses the term home-care professionals to refer to practical nurses, registered nurses and public health nurses who are working in home care and nursing homes. In Finland, a practical nurse is someone who has completed a vocational qualification and level-five training in social and health care, according to the European Qualifications Framework (EQF). They need to acquire 180 European Credit Transfer and Accumulation System (ECTS) credits, which each take 27 hours. Practical nurses working in home care have specialised in care and rehabilitation of the older people. Registered nurses and public health nurses have completed a level-six education according to the EQF with 210 ECTS and 240 ECTS, respectively at a University of Applied Sciences. (Gobbi & Kaunonen 2018.)

Home-care professionals working with older people perform several daily roles. These include providing advanced nursing care, making quick decisions (for example situations where older people health condition has deteriorated) and solving complex nursing problems. This means that the demand for home-care professionals with advanced nursing care competence has increased (Furåker, 2012; van den Bulck et al., 2018). In addition, feedback from older people indicates that home-care professionals' ability to make even quite small decisions about their health can have a significant impact on their ability to continue living at home. (Turjamaa et al., 2015; Mariani et al., 2017). As a result, making sure that home-care professionals have the

competence they need to evaluate older people with acute issues in a timely way, including those with complex conditions, is important. This might ensure that older people receive the care services they need (Kleisaris et al., 2019; Wang et al., 2019).

However, home-care professionals have been criticised for not having adequate competence, due to their task orientation practice. In other words, they often care for older people without evaluating their health (Westerberg et al., 2016; Molony et al., 2018). This illness-centred approach tends to focus solely on older people's physical decline and current needs. (Turjamaa et al., 2014; de Carvalho et al., 2017)

The literature contains many definitions of the concept of competence in nursing (e.g. Garside & Nhemachena 2013, Caruso et al., 2016). Focusing on gerontological nursing competence, it is defined as the knowledge and skills that home-care professionals need to ensure that they are capable of caring for older people (AACN, 2010). It provides a common baseline for professionals working with older people in different roles, both in long-term care and in their own homes. This competence includes certain knowledge and skills, person-centred communication and working together as professionals. It also includes organising and managing care for older people, improving their health and well-being and evaluating and improving the quality of the care that is provided (Dijkman et al., 2016).

Many educational interventions have been developed to enhance the competence that nurses need to evaluate acute care needs. For example, it has been suggested that web-based learning and simulation-based learning are effective ways to learn about evaluating acute care. Studies have also reported these methods are already widely used in continuing education for nurses.

(Liaw et al., 2016; Kang & Seomun, 2017.) Web-based learning initiatives can provide flexibility, as they can be accessed anytime and anywhere that there is Internet access. On the other hand, web-based learning methods have been criticised for their lack of interaction with other students (Koch, 2014). One study reported that effective learning can be time-consuming. (Cook et al., 2010.)

Simulation-based learning has increased in nursing education in recent years. It is an effective method, because it combines different learning methods and styles and focuses on affective, cognitive and psychomotor skills. (Oh et al., 2015; O'Regan et al., 2016.) Different types of simulation-based programs have been used for undergraduate and graduate medical education curricula (Curtis et al., 2012) and undergraduate nursing education and continuing education and training of medical, nursing and midwifery professionals (Elliott et al., 2011; Cant & Cooper, 2017). Simulations can feature various solutions and designs, such as standard patient issues and full-scale scenarios that describe authentic healthcare situations. (Curtis et al., 2012.)

Previous studies have showed that combined lecture and simulation-based education improved health care professionals' knowledge and practical technical skills for neurology patients. In addition, combined education improved other skills, such as cognitive learning and interdisciplinary communication and therefore, narrowed the clinical gap (Flood & Higbie 2016; Gupta et al., 2017). Furthermore, combining web-based lectures with simulations shows a more effective way of teaching than online lectures on their own (Lee et al., 2020).

Although simulation and simulation-based education has become an important teaching method in nursing education and in medical education, there is lack of research of utilising simulation to develop competence in gerontological nursing (Boscart et al., 2019). This is

particularly pertinent when it comes to home-care professionals evaluating whether people living in their own homes need acute care. More research on the effectiveness of simulation-based initiatives is needed to improve home-care professionals' competence in this specific area of older people's care. Therefore, the aim of this study is to investigate the effectiveness of combined web-based and simulation-based continuing education on home-care professionals' competence regarding evaluating older people's needs for acute care. This was measured before and after they took part in combined web-based and simulation-based continuing education. The results will be useful for developing continuing education for home-care professionals working in older people's care. It might improve older peoples' quality of care.

2 METHODS

2.1 Design

A quasi-experimental pretest-posttest design (Thompson & Panacek, 2006) was used and the overview of the design can be seen in Figure 1.

Insert Figure 1 about here

2.1.1 Study participants

The study population was home-care professionals, namely practical nurses, registered nurses and public health nurses. They were all working in older people's care, such as home care and nursing homes. A total of 254 home-care professionals participated in a combined web-based and simulation-based continuing education in 2017-2019 in home care organisation in one Finnish city. They were informed orally at the beginning of the continuing education about the

study and asked to take part in the pretest survey before they begun the continuing education. We included home-care professionals who were currently working in older people's care and spoke Finnish or English. 171 (67%) completed the online survey before the education and 83 (33%) completed the survey after it had taken place. Because they were guaranteed anonymity, it was not possible to identify participants who had taken part in both surveys.

2.1.2 Instrument development, validity and reliability

A multi-professional team developed the instrument that was used to measure home-care professionals' competence in evaluating older people's acute care needs (Johnson & Christensen, 2012). The team comprised a senior lecturer in nursing, a nurse manager, a geriatrician and a home-care professional who worked in older people's care. The content of the instrument was based on evidence from the literature and constructed using the objectives and content of a previous web-based course (Oermann & Gaberson, 2009). It comprised 30 items that covered eight subscales of competence: 1) health assessment and consultation (6 items); 2) type 2 diabetes (7 items); 3) infections (2 items); 4) neurology (3 items); 5) cardiovascular circulation (6 items); 6) respiration (4 items); 7) memory disorders (1 item) and 8) pain management (1 item). These areas were designed to cover the daily work tasks performed by home-care professionals working with older people in Finland (Dijkman et al. 2016; Kiljunen et al. 2019). Each item was rated by using a five-point Likert scale from one for totally disagree to five for totally agree. For example the home-care professionals were asked to evaluate the statement "I know how to use different methods of pain management" by saying they totally disagreed, disagreed, were undecided, agreed or totally agreed.

The content validity of the competence instrument was evaluated by an expert panel and pilot group. The expert panel consisted of five members (Polit & Beck, 2020): two geriatricians, one paramedic manager and two home-care professionals who worked in older people's care. They were asked to provide comments on each item. Two of the statements were revised following feedback from the expert panel: one in the type 2 diabetes category and one in the neurological diseases category (Polit & Beck, 2020). Then a pilot study was conducted with home-care professionals who had participated in the combined web-based and simulation-based education. The aim of this was to examine how clear and understandable the statements were and how long the instrument took to complete (Rattray & Jones, 2007). All 28 of the participants who were invited to take part responded and no statements needed to be clarified. The answers from the pilot study were not included in the research material. The internal consistency of the subscales was analysed using Cronbach's alpha coefficients (DeVon et al., 2007; Taber, 2018) and they ranged from 0.77 to 1.0 (Table 3).

2.1.3 Description of the combined web-based and simulation-based continuing education

The home-care professionals started the education on their own, by studying the web-based content. This included acute care evaluation, using the Airway, Breathing, Circulation, Disability, Exposure (ABCDE) protocol (Balas et al., 2013). It also covered effective clinical communication, using the Introduction, Situation, Background, Assessment and Recommendation (ISBAR) tool (Moi et al., 2020). Participants also studied the main diseases that can affect older people. This included how to identify symptoms and provide care in an acute situation and the principles of simulation-based learning methods. After they had completed the independent web-based learning, the home-care professionals were divided into small groups of 12 to 18 participants.

These groups then took part in the full-scale simulation, which lasted four hours and took place in the simulation center of one of the Finnish universities of applied sciences. This followed a 15-minute pre-simulation lecture that outlined the principles of the simulation learning methods and the ABCDE and ISBAR tools.

The simulations were run by a home-care professional and two senior nursing lecturers who had undergone simulation instructor education and were also authors of this study. This meant that no additional training was needed for this specific education. Each simulation presented two scenarios (Table 1). These were based on previously identified acute situations that home-care professionals face when caring for older people in their own home (Mariani et al., 2017; Kleislaris et al., 2019).

The simulations followed a common structure: introduction and briefing, action and debriefing (Dieckmann & Krage, 2013). During the introduction and briefing phases, the participants were told about the learning outcomes, the simulated older peoples' diseases, medical history and the need for care. The simulated action started when the older people entered the home and proceeded according to the participants' actions. Each scenario lasted 10 to 15 minutes and the instructors ended the scenario when the learning outcomes has been achieved. During the debriefing phase, the instructors acted as facilitators. The participants and instructors reflected on their experiences for 45 minutes and analysed what had gone well and what they would do differently in the future. All the participants agreed to maintain confidentiality regarding the matters discussed during the group simulations.

Insert Table 1 about here

2.2 Data collection

Data were collected online before and after the combined web-based and simulation-based continuing education by using the developed instrument. Participants' background factors were also asked: age, occupation, work place and work experience in both nursing and older people's care (Table 2). One of the authors sent the Internet link for the pre-test and post-test questionnaires to the home-care professionals and they answered them anonymously at their workplaces. The pre-test data were collected three weeks before the combined web-based and simulation-based continuing education and the post-test data were collected in the two weeks after the education took place.

2.3 Ethical considerations

The ethical principles of the Declaration of Helsinki (World Medical Association 2013) were followed throughout the study. The Ethics Committee of the University of Eastern Finland provided ethical approval (453/13.02.00/2015) and the participating healthcare organisation granted research permission. All the home-care professionals received a letter that provided information about the study. This included the confidential nature of the study, the voluntary nature of participation and the right to withdraw at any time. The participants were also informed that the study had been specially designed for this ongoing education and that the results would not be analysed by occupation groups to ensure the participants' privacy. Answering the on-line questionnaire was regarded as consent to participate.

2.4 Data analysis

The data were analysed with SPSS, version 25 software (IBM Corp, New York, USA). First, the data were divided in two groups: pre-test and post-test. Second, they were analysed using descriptive statistics, frequencies, percentages, mean values and standard deviations. The sum of the variables was formed out of the eight competence areas in the two groups. The mean values of the sub-scales were calculated by adding the item scores in each sub-scale and dividing the sum by the number of answers. Third, the normality of the data was analysed with the Kolmogorov-Smirnov test. As the data were not normally distributed, we used the Mann-Whitney U test to compare the mean scores between the two groups. This test is used for comparing groups when the participants are not necessarily the same. The statistical results were considered to be significant if the p value was <0.05 .

3 RESULTS

3.1 Demographic characteristics

A total of 171 home-care professionals working with older people completed the questionnaire before the combined web-based and simulation-based continuing education. In addition, 83 responded to the questionnaire after the education. As previously stated, it was not possible to determine how many participants completed both questionnaires, as their identity was confidential. Most of the participants were practical nurses (87.1% pre-test and 89.2% post-test) and were currently working in older people's care. This was either in home care (64.3% and 60.2%) or nursing homes (31.6% and 36.2%). The majority had more than 10 years' experience of working in older people's care (41.2% and 41.5%) (Table 2).

Insert Table 2 about here

3.2 Self-assessed competence to evaluate older people's needs for acute care

The home-care professionals' mean over all competence score was 3.22 ± 0.51 out of 5.0 before the combined web-based and simulation-based continuing education (Table 3). The highest mean pre-test score was for the respondents' competence in evaluating type 2 diabetes (3.60 ± 0.52) and the lowest was for evaluating neurological issues (2.94 ± 0.73). After the combined web-based and simulation-based continuing education, the mean overall competence score had risen by 0.70, to 3.92 ± 0.57 out of 5.0. The highest scores were for competence in evaluating memory disorders (mean 4.10 ± 0.69) and the lowest was for neurology (mean 3.67 ± 0.67).

When it came to the overall scores for competence, there were significant differences in the mean improvements between the pre-test and post-test groups ($p < 0.001$). The mean difference was 0.69, with a 95% confidence interval (CI) of 0.55 to 0.83. In addition, significant improvements were detected in all eight subscales ($p < 0.001$). At the subscale level, the participants' showed the greatest improvement in their competence for health assessment and consultation (mean difference 0.98, 95% CI 0.82 to 1.14) and the least improvement for handling type 2 diabetes (mean difference 0.49, 95% CI 0.34 to 0.63). The improvements in the respondents' competence were not related to their occupation, workplace, age group or work experience in both nursing and older people's care (Table 3).

Insert Table 3 about here

4 DISCUSSION

This study aimed to investigate the effectiveness of combined web-based and simulation-based continuing education on home-care professionals' competence regarding evaluating older people's needs for acute care. This was measured before and after they took part in combined web-based and simulation-based continuing education. In many countries, the goal for older people's care is to support them to live independently at home or in a homely environment (de Carvalho et al., 2017; de Bruin et al., 2018). This means that home-care professionals need to be competent to evaluate the acute care needs of older people with chronic diseases and complex conditions.

Our study found that the home-care professional's self-assessed competence in relation to evaluating older people's acute care needs improved in all eight areas. The improvements were highest in health assessment and consultation, respiration, neurology and pain management. They were lowest in type 2 diabetes, infections, cardiovascular circulation and memory disorders. In addition, our study provided new knowledge about combined web-based and simulation-based continuing education for home-care professionals. However, the improvement of competence must be viewed critically, because the mean difference was so small, albeit significant. The final answer to the clinical significance of the improvement of competence can only be obtained when it is known how competence is proved in clinical practice and research should be continued.

We identified three critical issues regarding how the home-care professionals viewed their competence in these areas. These were their highest and lowest self-assessed areas of competence and how effective simulation was as a teaching method in continuing education.

The self-assessed competence that showed the greatest improvement was health assessment and consultation, which is a significant area for home-care professionals working in older people's care (Mariani et al., 2017). Individualised health assessments play a significant role in helping older people to live independently and this is particularly true in acute care situations (Turjamaa et al., 2015; Mariani et al., 2017). However, the levels of competence that home-care professionals display in assessing health have been criticised. This is because they tend to adopt a task orientation mentality and illness-centred approach that only focuses on people's physical declines and needs (Turjamaa et al., 2014). Being able to consult older people during health assessments, and show competence during this process is also important. Effective and appropriate communication and consultation are needed when caring for older people with acute care needs. This can prevent hospitalisation and improve their health and their ability to live independently. During the web-based and simulation-based continuing education, participants studied and used ABCDE protocol and ISBAR tool to ensure effective clinical communication. Using the ISBAR structure provides effective communication, which is vital if home-care professionals are to ensure that older people receive high quality care and are safe (Narayan 2013; Moi et al., 2020).

Studies have reported that competence in multi-professional communication and consultation is needed when caring for older people. This competence should enable home-care professionals to share information that has been collected, make quick decisions and solve

complex nursing problems. (Janssen et al., 2012; Turjamaa et al., 2014.) In addition, it is important that older people play an active role in communication. Discussing how they live with complex health situations improves the decisions that home-care professionals make when it comes to solving complex nursing problems. (Furåker, 2012; van den Bulck et al., 2018.) However, it has been reported that home-care professions do not always consider individual health needs when they assess older people and they do not address the challenges that may rise in the future (Janssen et al., 2012; Turjamaa et al., 2014).

The lowest improvement of competence in our study was type 2 diabetes. However, this was already the highest level of self-assessed competence in the pretest assessment. This high level is probably why it showed the lowest level of improvement after education. It is evident that home-care professionals require multiple competences to manage the individual and acute needs of older people living with type 2 diabetes. They need knowledge, skills and the ability to take action in acute care situations. This includes coordinating care in multi-professional collaborations and using point-of-care and standardised tools, such as ISBAR, to structure communication. (Hausken & Graue, 2013; Fox & Kilvert, 2016.)

Our study provides new knowledge about how the combination of web-based and simulation-based education can be used to provide home-care professionals with continuing education. We found that this education method was an effective way of improving home-care professionals' competence when it came to evaluating acute care in gerontological nursing. This is because web-based learning can provide a more flexible approach to learning, as it can be done anytime and anywhere and may reduce learning time (Koch, 2014). In addition, studies have recognised that simulation is an effective continuing education method. This is because it

combines affective, cognitive and psychomotor skills and allows professionals to take advantage of their previous knowledge and skills. (Shin et al., 2015; O'Regan et al., 2016.) It is well known that caring for older people requires competence, including knowledge, skills, values and attitudes (Cimino et al., 2014; Wang et al., 2019). Therefore, our results confirm that simulations can expand the competence that home-care professionals need to work in older people's care (Boscart et al., 2019). These include the timely evaluation of older people's health conditions and communication (Reime et al., 2016). They also include better management of acute situations (Andrea & Kotowski, 2017; Jakobsen et al., 2018) involving complex symptoms (Kleisaris et al., 2019; Wang et al., 2019).

4.1 Strengths and limitations

A strength of this study is that it provides valuable information on home-care professionals' competence regarding evaluating older people's acute care needs. This was measured before and after they took part in a combine web-based and simulation-based continuing education. In addition, this study provides valuable knowledge internationally on this method of continuing education for home-care professionals caring for older people. This is important, as the current literature provides little knowledge on simulation-based learning in gerontological nursing, particularly regarding how home-care professionals evaluate older people's acute care needs.

There are limitations related to the sample. We included all home-care professionals who responded to the pretest and posttest surveys. This means that the sample size was not based on power analysis. The post-test response rate was only 33%, which may have influenced the study results. As our data collection was anonymous, we could not link the pre and post

education surveys. Possibly, home-care professionals participating in both measurements represent a particularly active group, which may cause bias in the interpretation of the results and thus, threaten internal validity. Additionally, our study lacked a control group, which could have helped to increase validity of our study. However, we wanted to use as much data as possible in the analysis. That is why we used a statistical test that was able to compare mean scores between the two groups even though the participants were not necessarily the same. There were no differences in the socio-demographic variables of the participants who completed the questionnaires before and after the education. Nevertheless, it is necessary to consider these limitations in future studies.

Our findings do not represent the self-assessed competence of all home-care professionals in Finland. However, we do feel that they do represent the competence of home-care professionals working in older people's care. No existing instrument was available to measure the value of the combined web-based and simulation-based continuing education. Therefore, we developed an instrument based on evidence from the literature and constructed from the objectives and content of a previous web-based course and simulations (Oermann & Gaberson, 2009). The content validity of the instrument was evaluated by an expert panel and pilot group. This means that the study results should be interpreted with care and the possibility of bias related to this novel self-assessment instrument should be acknowledged. It is well known that self-assessment provides valuable information on the competence of home-care professionals (Cowan et al., 2005; Bing-Jonsson et al., 2016). However, competence is a complex issue and it is challenging to unequivocally define and measure this concept (Cowan et al., 2008; Kiljunen et al., 2019). In addition, self-assessment is a subjective method. For example, the educational

backgrounds of practical nurses and registered nurses may influence how they assess their own competence (Wangenstein et al., 2018). The reliability and validity of our study could have been increased by using two different methods to assess the competence of the home-care professionals who took part in our study (Bahreini et al., 2011).

The internal consistency of the subscales that measured the various competences included in the study varied from 0.77. to 1.0. The memory disorders and pain management subscales only included one item, which meant that the coefficient of these subscales showed high internal consistency. Total alpha was 0.97 and this indicates that the instrument should be developed further (DeVonn et al., 2007). The instrument was developed by a multi-professional team who used existing information on web-based and simulation-based education. We recognise that our study is just one step in the process of assessing how competent home-care professionals are when it comes to evaluating the acute care needs of older people.

5 CONCLUSION

Home-care professionals who provide care services for older people, including those with complex symptoms, must have the competence required to assess their acute care needs in a timely way. This requires continuing, individually designed education programs that focus on acute care evaluation and take account of professionals' previous skills and knowledge.

Providing this continuing education by using a combination of web-based and simulation-based methods seems to be an effective way of increasing home-care professionals' competence in this area. However, because of the limited research in this area, more research is needed to evaluate the effectiveness of combination of web-based and simulation-based methods,

particularly in the field of acute care evaluation in older people's home care. Healthcare organisations, education organisations and researchers need to work together to ensure that home-care professionals are competent to evaluate older people's acute care needs. This will have a positive impact on their well-being and their ability to continue to live in their own home. It is recommended that evaluating older people's needs for acute care should be embedded in curricula and continuing education programmes.

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Table 1. Description of simulation scenarios.

Small group simulations	
Scenario 1	Scenario 2
<p>85-year-old female home care client. Diseases: hypertension, type 2 diabetes, hyperkolesterolemia, Alzheimer's disease (mini mental state examination score 23/30). Medication:</p> <ul style="list-style-type: none"> - Losartaanikalium 100 mg x 1 - Glargininsulin 100 IU/ml 40 unit - Simvastatin 20 mg x 1 - Memantine 10 mg x 1 	<p>82-year-old female home care client. Diseases: atrial fibrillation, coronary artery disease, hypertension, heart failure, gout. Medication:</p> <ul style="list-style-type: none"> - Varfarin 3 mg - Furosemide 40 mg x 2 - Bisoprolol 10 mg x 2 - Levothyroxine 10 mg x 2 - Allopurinol 100 mg 1 x 1 - Nitroglycerin spray 1.25 mg

Table 2. Home-care professionals' background factors

Background factor	Before education (n=171) n (%)	After education (n=83) n (%)
<i>Occupation</i>		
Practical nurse	149 (87.1)	74 (89.2)
Registered nurse	19 (11.1)	8 (9.6)
Public Health Nurses	3 (1.8)	1 (1.2)
<i>Age</i>		
18-24 years	14 (8.2)	8 (9.6)
25-34 years	32 (18.7)	16 (19.3)
35-44 years	34 (19.9)	15 (18.1)
45-54 years	42 (24.5)	21 (25.3)
55- years	49 (28.7)	23 (27.7)
<i>Workplace</i>		
Home care	110 (64.3)	50 (60.2)
Nursing home	54 (31.6)	30 (36.2)
Other	7 (4.1)	3 (3.6)
<i>Work experience in nursing</i>		
< 1 year	10 (5.8)	4 (4.8)
2-5 years	54 (31.6)	29 (34.9)
6-10 years	23 (13.5)	10 (12.1)
10- years	84 (49.1)	40 (48.2)
<i>Work experience in older people's care</i>		
< 1 year	(n=170)	(n=82)
2-5 years	13 (7.6)	4 (4.9)
6-10 years	64 (37.6)	32 (39.0)
10- years	23 (13.6)	12 (14.6)
	70 (41.2)	34 (41.5)

Table 3. Improvements in self-assessed competences

Subscale	Before education (n=171) Mean (SD) range	After education (n=83) Mean (SD) range	Improvement Mean 95% CI	p values	Cronbach's alpha
Health assessment and consultation	2.97 (0.61) (1.0–5.0)	3.95 (0.59) (2.0–5.0)	0.98 (0.82–1.14)	<0.001	0.88
Type 2 diabetes	3.60 (0.52) (2.0–5.0)	4.09 (0.60) (2.0–5.0)	0.49 (0.34–0.63)	<0.001	0.92
Infections	3.43 (0.61) (1.0–5.0)	3.93 (0.61) (2.0–5.0)	0.50 (0.35–0.67)	<0.001	0.77
Neurology	2.94 (0.73) (1.0–5.0)	3.67 (0.67) (2.0–5.0)	0.73 (0.55–0.92)	<0.001	0.85
Cardiovascular circulation	3.22 (0.57) (1.0–5.0)	3.81 (0.63) (2.0–5.0)	0.59 (0.45–0.76)	<0.001	0.89
Respiration	3.02 (0.77) (1.0–5.0)	3.88 (0.73) (2.0–5.0)	0.86 (0.66–1.06)	<0.001	0.89
Memory disorders	3.48 (0.74) (2.0–5.0)	4.10 (0.69) (2.0–5.0)	0.62 (0.43–0.80)	<0.001	1.0
Pain management	3.11 (0.79) (1.0–5.0)	3.75 (0.68) (2.0–5.0)	0.64 (0.44–0.84)	<0.001	1.0
Overall	3.22 (0.51) (1.0–5.0)	3.92 (0.57) (2.0–5.0)	0.69 (0.55–0.83)	<0.001	0.97