


## ORIGINAL ARTICLE

# Lifelong learning in community healthcare: Testing competence after learning activities in a blended learning space

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## Abstract

**Aims and Objectives:** This study reports from a municipality in Norway that implemented a competence enhancement programme for all its institutional nursing staff during the COVID-19 pandemic to fill identified competence gaps.

**Background:** Many Norwegian municipalities are experiencing a demand for expanded community healthcare services due to an increase in elderly patients and patients with extensive and complex needs. At the same time, most municipalities are striving to recruit and keep competent health personnel. New ways of organising and increasing the competence of the workforce may help ensure that the healthcare delivered corresponds to patients' changing needs.

**Design and Methods:** Nursing staff were encouraged to complete targeted competence enhancing activities with the aim of enhancing their competence in identified areas. The learning activities were blended and consisted of e-learning courses, lectures, supervision, vocational training and meetings with a superior. Competence was measured before and after the competence enhancing activities ( $n = 96$ ). The STROBE checklist was applied.

**Results:** The results provide insight into the competence development of registered nurses and assistant nurses in institutional community health services. They show that the implementation of a workplace-based blended learning programme improved competence significantly, especially for assistant nurses.

**Conclusions:** Offering workplace-based competence enhancing activities seems to be a sustainable way of facilitating lifelong learning among nursing staff. Facilitation of learning activities in a blended learning space may enhance accessibility and increase the potential for participation. A combination of reorganisation of roles and simultaneous competence enhancing activities can ensure that both managers and nursing staff prioritise filling competence gaps.

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**KEY WORDS**

assistant nurses, blended learning, community healthcare, competence measurement, learning activities, nursing staff

**INTRODUCTION**

Competent health personnel are the main asset in community healthcare services and a necessity for maintaining quality in service provision [1]. However, the future sustainability of healthcare services is threatened in many countries as the need for services is outpacing labour supply worldwide [2]. In Norway, many municipalities are experiencing a demand for expanded community healthcare services due to an increase in elderly patients and patients with extensive and complex needs. At the same time, most municipalities are striving to recruit and keep competent health personnel [3]. In addition to demographic challenges, the growing complexity of community healthcare creates a need for organisational changes and alterations in professional roles, tasks and responsibilities to be sustainable. New ways of organising and increasing the competence of the workforce may help ensure that the healthcare delivered corresponds to patients' changing needs [4].

**BACKGROUND**

In Norway, nursing staff mainly consist of registered nurses (RNs), assistant nurses (ANs) and assistants. While assistants have no formal qualifications in healthcare except workplace training, RNs have a 3-year bachelor's degree (or higher) in healthcare. ANs develop their clinical competence over 2 years of basic education at vocational school, followed by 2 years of supervised clinical training. ANs' main scope of practice is direct patient care supervised by a RN along with delegated tasks and activities. The ANs' role has traditionally been associated with a low degree of autonomy and responsibility, making it somewhat undefined [5]. RNs' scope of practice has been well established, leaving them with the overall responsibility for patient care.

Despite the differences in qualifications in terms of education and training for RN versus ANs, their roles in community healthcare are still fairly similar [5]. This is mainly due to the non-hierarchical structure in Norwegian community healthcare but also linked to traditional cultures of roles and task performance. With the expansion of both scope and complexity in community healthcare that has been identified in recent years, the need for competence development and clarification of roles between different groups of nursing staff has become urgently apparent [3].

Several factors influence the competence and retention of staff, of which self-efficacy and life-long learning are emphasised here [6]. Nursing staff need to feel competent

to be intrinsically motivated to perform [7, 8]. Professional self-efficacy is one of the most important factors in keeping a competent workforce and preventing high turnover [9–11]. However, to be able to perform, employees need adequate opportunities to act on motivation and mobilise competence. Lai and Kapstad [12] state that perceived competence mobilisation is the degree to which employees perceive that they have adequate opportunities to utilise their competence in their current jobs. Their findings suggest that a high level of perceived competence mobilisation is associated with several favourable employee attitudes, including higher intrinsic motivation and lower turnover intention. When considering the relative importance of self-efficacy versus perceived competence mobilisation, it seems plausible that perceptions of actual opportunities for competence development and role performance in the workplace will have a strong and direct impact on employees' motivation, commitment and intention to stay in the job. To achieve better self-efficacy amongst employees, it is therefore vital to facilitate the development of competence in the workplace in a life-long learning perspective.

To face the increasing challenges associated with workforce supply, emphasis has been placed on the concept of lifelong learning—a perspective focusing on learning as an ongoing process for health personnel post-education [6]. The Norwegian government has correspondingly initiated measures, such as skills training programmes and competence development of health personnel [13]. In addition, competence enhancing activities such as courses, skills training, presentations, workshops and seminars aiming to develop employees' skills have been initiated at a more local level. However, the activities vary among municipalities with respect to scope, structure and whether they are part of a long-term competence development plan. Competence enhancing activities constitute a major investment and cost for the municipalities, competing with the management of day-to-day operations and ensuring sufficient manpower in direct patient care [14]. Still, evaluations of the advantage of such investments, and assessments of the need for further competence development are often lacking. To achieve lifelong learning in a sustainable way, the methods of bridging the competence gap between employees' actual competence and current guidelines and requirements to maintain quality and safety in patient care must be analysed. Investigating the degree to which competence enhancing activities achieve the desired results in terms of actual competence development among health personnel, and how this benefits the organisation and ultimately the quality of patient care, is important for

sustainable healthcare services. Competence development is thus the concept of investigation in this study.

## INTERVENTION

This study draws from a project in Flekkefjord municipality in Norway whose purpose was to identify competence gaps amongst nursing staff and propose targeted competence enhancing activities to fill those gaps. Municipal managers initiated a reorganisation of the community healthcare services with the goal of improving task sharing among nursing staff. RNs were reorganised into nursing teams while ANs were given more responsibility and independent tasks. A three-step competence development programme was implemented to assure the quality of the reorganisation.

First, the municipality measured the competence of the participating nursing staff using the Nursing Older People—Competence Evaluation Tool (NOP-CET). Details about the measurement are presented in the Methods section. Second, since competence gaps were identified, the nursing staff were encouraged to complete targeted competence enhancing activities with the aim of enhancing competence in identified areas. The learning activities were blended and consisted of e-learning courses, lectures, supervision, vocational training and meetings with a superior. Due to the onset of the COVID-19 pandemic, most learning activities had to be digital. [Table 1](#) depicts all the learning activities in detail. Third, the nursing staff once again completed the same competence measurement with the NOP-CET in order to detect changes in competence level. We have called the first competence measurement round 1, the competence enhancement activities ‘the intervention’, and the second competence measurement round 2. See [Table 2](#) for an overview of the competence development programme. Based on this process, we developed the following research questions:

- Which learning activities did the nursing staff take part in?
- How did competence develop between round 1 and round 2?
- How did level of education influence competence development?

## METHOD

### Design

The competence mapping has a quantitative cross-sectional design. A digital questionnaire called ‘Nursing

Older People—Competence Evaluation Tool’ (NOP-CET) [15] was used. The NOP-CET is a comprehensive questionnaire measuring competence in community elderly care. It uses a mix of approaches to the concept of competence to grasp individual competence in terms of knowledge, skills and personal abilities, as well as relational and contextual aspects of competence in community healthcare [16]. The questionnaire contains a total of 65 items. There are two main types of items: items with Likert-type scales (all except one item use a four-point scale) and test items with dichotomous scores (correct/wrong). Some items ask for self-evaluation, others are in multiple-choice format. The development of the NOP-CET had three phases, which are described thoroughly in Bing-Jonsson, Bjørk [17] and Bing-Jonsson, Hofoss [15]. The NOP-CET covers competence within 10 categories: health promotion and disease prevention, treatment, palliative care, ethics and regulation, assessment and taking action, covering basic needs, communication and documentation, responsibility and activeness, cooperation and attitudes towards older people. In its first survey, the NOP-CET was evaluated to be appropriate as it showed good content and construct validity, reliability, precision, interpretability, acceptability and feasibility [15]. This is the second publication to use the NOP-CET. The STROBE checklist was applied for this research.

### Data collection

The population consisted of nursing staff—assistants, ANs and RNs—in the municipality of Flekkefjord, Norway. The total number of nursing staff who received an invitation to take part in the competence mappings and the intervention was 182; of which 122 invitations were sent to the nursing home and 60 invitations to the unit for rehabilitation.

The data collection took place between December 2020 and April 2022 and is described in detail in [Table 2](#). The NOP-CET (competence mapping rounds 1 and 2) was administered electronically by the online tool ‘KS-learning’, a Norwegian digital learning space for community healthcare. Participants received an e-mail with a link to the questionnaire followed by up to four reminders.

### Analysis

Only the test items in the NOP-CET were used for analysis in this publication as these have a predetermined score sheet. All test items with dichotomous scores (correct/wrong) in the NOP-CET were coded 1 for correct and 0 for wrong. All dichotomous scores were then added into a

TABLE 1 Learning activities in the intervention.

Competence area	Type of course	Learning activities	Assessment	Duration—No. of participants—profession
Cardiopulmonary resuscitation (CPR)	Films	Film from the Red Cross, how to perform CPR <a href="https://www.youtube.com/watch?v=7IwhlClg6TA">https://www.youtube.com/watch?v=7IwhlClg6TA</a> . Duration approximately 30 min	No assessment	19 ANs
Falls	E-learning courses	Courses designed to increase knowledge about fall prevention training and the need for physical activity <a href="https://www.basis-fallforebygging.no/kurs/">https://www.basis-fallforebygging.no/kurs/</a> . Duration approximately 10 min	Quiz	9 ANs
Practical teaching regarding cardiopulmonary resuscitation (CPR)	Lectures and practical training	Lectures, how to perform CPR, cardiac arrest, car and motorcycle accidents, CPR in case of drowning, first aid for a stroke, disease aggravation, use of a defibrillator, poison and drugs, life-threatening bleeding and practicing CPR. Duration approximately 180 min	No assessment	1 RN 10 ANs 2 Assistants
Ulcers	Articles and films	General about ulcers, arterial and venous foot and leg ulcers. <a href="https://www.helsebiblioteket.no/fagprosyre/ferdige/trykksar-behandling-i-sykehjem">https://www.helsebiblioteket.no/fagprosyre/ferdige/trykksar-behandling-i-sykehjem</a> <a href="https://ehandboken.ous-hf.no/document/758">https://ehandboken.ous-hf.no/document/758</a> <a href="https://ehandboken.ous-hf.no/document/762">https://ehandboken.ous-hf.no/document/762</a> Duration approximately 20 min	No assessment	5 RNs 12 ANs 4 Assistants
Diabetes	Recorded video lessons about diabetes	Lectures about diabetes treatment, diabetes types, hypo and hyperglycaemia. Duration approximately 60 min.	No assessment	32 ANs
Basic competence diabetes	E-learning courses	Video and texts on diabetes treatment, diabetes types, hypo and hyperglycaemia Basismodul—Diabetes: Kursets forside ( <a href="https://www.basis-fallforebygging.no/">kslaring.no</a> ). Duration approximately 60 min	Certificate	1 RN 3 ANs 1 Assistant
Physical activity and preventive treatment	E-learning courses	Online learning courses on the elderly and the aging process and general health benefits of physical activity and exercise <a href="https://www.basis-fallforebygging.no/kurs/">https://www.basis-fallforebygging.no/kurs/</a> . Duration approximately 22 min	Quiz	20 ANs
Transfer techniques	In-person course	Lecture and practice transfer techniques. Duration approximately 60 min.	No assessment	18 ANs
Patient assessment news 2	E-learning courses and films	Training films on how to perform NEWS2 mapping. <a href="https://www.kslaring.no/local/course_page/home_page.php?id=20127&amp;start=0">https://www.kslaring.no/local/course_page/home_page.php?id=20127&amp;start=0</a> Duration approximately 30 min	No assessment	22 ANs 1 RN 3 Assistants
Positioning/pressure relief	E-learning courses	Prevention of pressure, identify and reverse pressure ulcers <a href="https://kurs.helse-sorost.no/ScormServices/ScormStart.aspx?load=preview&amp;scorm_version=1.2&amp;starting_url=/elps40/Content/d5952373-7f25-4db2-aa3c-8563de6d5f93/index.html">https://kurs.helse-sorost.no/ScormServices/ScormStart.aspx?load=preview&amp;scorm_version=1.2&amp;starting_url=/elps40/Content/d5952373-7f25-4db2-aa3c-8563de6d5f93/index.html</a> Duration approximately 12 min	No assessment	1 RN
Hygiene	E-learning courses	Basic infection control routines Basale smitteverrutiner - et e-læringskurs på <a href="https://www.kompetansebroen.no/">Kompetansebroen</a> Kompetansebroen. Duration approximately 15–20 min	No assessment	5 RNs 11 ANs 1 Assistant

TABLE 1 (Continued)

Competence area	Type of course	Learning activities	Assessment	Duration—No. of participants—profession
Ethics/ethical issues	E-learning courses and films	Ethical issues are presented via video. The course is designed to increase the ability for ethical reflection. <a href="https://www.kslaring.no/local/course_page/home_page.php?id=1578&amp;start=0">https://www.kslaring.no/local/course_page/home_page.php?id=1578&amp;start=0</a> Duration approximately 60 min	Certificate	18 ANs 1 Assistant
Observational competence news 2	E-learning courses	Increased competence in identifying life threatening conditions earlier, observation competence, ensuring that the patient receives the necessary treatment quickly and preventing hospitalisations. <a href="https://www.kslaring.no/local/course_page/home_page.php?id=20127&amp;start=0">https://www.kslaring.no/local/course_page/home_page.php?id=20127&amp;start=0</a> Duration approximately 30 min	Certificate	1 RN 3 ANs 2 Assistants

sum score that had a minimum score of 1 and maximum score of 62. Sum score 1 refers to the sum score on round 1, while sum score 2 refers to the sum score on round 2. The sum score is how competence is measured in this study.

In order to detect the development in competence as measured by the sum scores, we computed a variable called 'competence improvement'. The equation is 'Sum score 1 subtracted from Sum score 2'.

The data were processed in IBM SPSS Statistics 28. Descriptive frequency analyses and crosstabs were used. Virtually normally distributed data allowed the use of parametric analyses such as paired sample *t*-test and linear regression. *p*-value  $\leq 0.05$  was considered statistically significant. *T*-test and linear regression were performed on data of participants that had completed both rounds 1 and 2. Due to the small number of respondents, only one dependent variable was used in the regression model. Descriptive statistics were performed on data from round 1.

## Ethical considerations

The managers of the participating institutions approved the survey and informed the staff orally in meetings and in writing via notices about the purpose of the study, consent and the right to withdraw from the survey, anonymity and other matters regarding storage and time until destruction of the collected data. This information was available in an information letter. The Norwegian Centre for Research Data pre-approved the project (reference number 211929) (serves as compulsory data protection service).

## RESULTS

There were few participants who completed both round 1 and round 2. The total number of participants that completed the whole questionnaire in both rounds 1 and 2 was 12 (5 RNs, 7 ANs and 0 assistants). The number of participants who completed round 1 only was 96 (21 RNs, 71 ANs and 4 assistants). Of the total number of 182 invited participants, 7% of ANs and RNs responded in both rounds 1 and 2, compared to 53% in round 1.

In the group that completed the questionnaire in rounds 1 and 2 ( $n = 12$ ), all worked in a nursing home and 58% had been at their current workplace for more than 10 years. Respondents were experienced RNs and ANs, with 83% having more than 10 years of experience working in healthcare professions.

In the group that completed round 1 only ( $n = 96$ ), 79% worked in a nursing home, 18% in the rehabilitation

**TABLE 2** Overview of time line for data collection and intervention.

Participants	Round 1	Intervention	Round 2
ANs in nursing home	December 2020–March 2021	January 2021–October 2021	October 2021–April 2022
RNs in nursing home	May 2021–June 2021	May 2021–December 2021	December 2021–January 2022
Assistants, ANs and RNs at rehabilitation unit	November 2021–January 2022	November 2021–March 2022	March 2022–April 2022

unit and 3% in another workplace. Fifty-one percent had been at their current workplace for more than 10 years, while 27% had worked for 3 years or less. Of these respondents, 66% had more than 10 years of experience working in healthcare professions, while 14% had 5 years or less. Sample characteristics are described in [Table 3](#).

### The most visited learning activities

[Table 1](#) depicts all learning activities that took place during the intervention and shows competence areas, type of courses and assessment forms, as well as the number of participants between the groups of nursing staff. [Table 1](#) shows the variety of learning activities that took place during the intervention period. All in all, more ANs completed the learning activities than other groups of nursing staff. The courses that had most participants were in the following competence areas: CPR (19 ANs), ulcers (12 ANs), diabetes (32 ANs), physical activity (20 ANs), transfer techniques (18 ANs), patient assessment (22 ANs) and ethical issues (18 ANs). The courses with most RNs were ulcers (5 RNs) and hygiene (5 RNs).

### Development of competence between round 1 and round 2

On average, the participants received a lower sum score before the competence enhancement activities ( $M = 43.92$ ,  $SE = 1.59$ ) than after the competence enhancement activities ( $M = 47.25$ ,  $SE = 1.21$ ). This difference, or average increase in sum score, 3.33, BCa 95% CI ( $=0.76, 5.91$ ), was significant despite the small sample size,  $t(11) = 2.85$ ,  $p = 0.016$  and represents a small to medium-sized effect,  $d = 4.1$  [18]. ([Table 4](#)).

### The influence of education on competence development

The linear model presented explained 47% of the variance in the dependent variable: competence improvement. The  $F$ -ratio of 8.72 with a  $p$  value of 0.014 means that our

regression model predicted competence improvement significantly better than no model of competence improvement. The linear model showed that ANs improved 5.37 points more than RNs ( $p = 0.014$ ) between round 1 and round 2 ([Table 5](#)).

## DISCUSSION

This study draws on a project in a municipality in Norway whose purpose was to identify competence gaps amongst nursing staff and propose targeted competence enhancing activities to fill these gaps. Results of the competence measurements revealed an increase in competence among participating nursing staff. The present study was carried out during the COVID-19 pandemic with restrictions that meant for most of the time, it was not possible to gather staff for practical training or classroom learning activities. Thus, most learning activities were completed individually and on a digital platform. The ANs took part in a range of blended learning activities during the intervention. We found that ANs showed a greater increase in competence compared to RNs after the competence enhancing activities. These results provide insight into the competence development of RNs and ANs in institutional community healthcare services. They show that facilitating a workplace-based blended learning programme improved competence significantly, especially for ANs.

Workplace-based competence enhancing activities have been emphasised as a sustainable way of facilitating lifelong learning among community health nursing staff. Such activities are often both convenient and cost-effective and can be maintained without draining staffing levels and disrupting delivery of patient care [19]. King et al. [20] emphasise the importance of the clinical relevance of workplace-based learning to motivate staff to participate. In Flekkefjord, the competence development programme made each employee responsible for completing modules responding to their lack of competence. The results show that the competence areas with the most participants were clinically oriented and practical and that ANs had a significant increase in competence between rounds 1 and 2. The fact that the competence enhancing activities were targeted to address specific competence gaps identified

**TABLE 3** Characteristics of participants.

Variable	Count TC <i>n</i> = 12	%	Count OF <i>n</i> = 96	%
Gender				
Female	12	100	87	90.6
Male	0	0	9	9.4
Age				
18–24	1	8.3	4	4.2
25–34	2	16.7	10	10.4
35–44	3	25.0	24	25.0
45–54	2	16.7	24	25.0
55–64	4	33.3	31	32.3
65 or older	0	0	3	3.1
Education/occupation				
AN	7	58.3	71	74.0
RN	5	41.7	21	21.9
Assistant	0	0	4	4.2
Years since education				
0–2	3	25.0	14	14.6
3–4	0	0	10	10.4
5–9	1	8.3	7	7.3
10–14	2	16.7	18	18.8
15 or more	6	50.0	47	49.0
Workplace				
Nursing home	12	100	76	79.2
Unit for habilitation	0	0	17	17.7
Other	0	0	3	3.1
Years at current workplace				
0–1	2	16.7	8	8.3
1–3	1	8.3	18	18.8
3–5	1	8.3	6	6.3
5–10	1	8.3	15	15.6
10–15	4	33.3	16	16.7
15–20	0	0	13	13.5
20 or more	3	25.0	20	20.8
Position type				
Permanent	12	100	92	95.8
Temporary	0	0	3	3.1
Other	0	0	1	1.0
Position size				
15–25	0	0	3	3.1
25–50	1	8.3	6	6.3
50–60	3	25.0	10	10.4
60–70	0	0	6	6.3
70–80	3	25.0	38	39.6
90–100	1	8.3	15	15.6
100	4	33.3	18	18.8

(Continues)

TABLE 3 (Continued)

Variable	Count TC <i>n</i> = 12	%	Count OF <i>n</i> = 96	%
Years working in healthcare				
0–1	1	8.3	1	1.0
1–3	0	0	6	6.3
3–5	0	0	6	6.3
5–10	1	8.3	20	20.8
10–15	6	50.0	17	17.7
15–20	1	8.3	14	14.6
20 or more	3	25.0	32	33.3

Abbreviations: OF, Only first, participants that completed only round 1; TC, Total count, participants that completed the whole questionnaire in both rounds 1 and 2.

TABLE 4 Results from the *t*-test of competence development between round 1 and round 2.

	Mean	SD	SE	95% CI		<i>t</i>	df	Significance	
				Lower	Upper			One-sided <i>p</i>	Two-sided <i>p</i>
Sumscore 2 – Sumscore1	3.33	4.05	1.17	0.76	5.91	2.85	11	0.008	0.016

TABLE 5 Linear model of competence improvement.

	<i>B</i> (SE)	SE <i>B</i>	<i>p</i>
Constant	0.20 (1.39)		0.888
ANs <sup>a</sup>	5.37 (1.82)	0.68	0.014

Note:  $R^2 = 0.47$ ,  $\Delta R^2 = 0.41$  ( $p = 0.00$ ),  $F = 8.72$ ,  $p = 0.014$ .

<sup>a</sup>Reference group is RNs.

through the competence measurement in round 1 might have actualised the programme for the participants, as they were offered learning activities corresponding with their expressed needs. The potential to respond directly to the actual competence needs of the workplace is a benefit of workplace-based training that has been emphasised in the literature [21]. This might have had a positive effect on the competence development of the ANs. As RNs did not have the same level of participation, nor increase in competence as ANs, further exploration into the correct level of targeting and facilitation for participation for RNs is necessary.

The competence enhancing activities in the programme consisted of various approaches to learning, leaning heavily on digital learning caused by COVID restrictions. We know that using learning activities that are flexible and accommodate personal learning preferences may enhance learning. Generation Z nurses expect creative teaching techniques, enjoy innovative learning techniques and prefer graphics over words [22]. Even if the participants in this study cannot be characterised as Generation Z, the fact that the learning activities were facilitated in a blended learning space might have enhanced accessibility and increased the potential for participation. Moreover,

nursing staff also had the opportunity to collaborate with colleagues and participate in vocational training, which is a way of facilitating learning through feedback. In this way, a blended learning space was constructed. Together with the targeted competence enhancing activities, this might have motivated nursing staff participation and enabled completion of the different learning activities in the competence development programme.

However, the benefits of the factors mentioned above depend on the willingness of managers to create time and space for nursing staff to participate in learning activities; if they fail to do so, poor staffing levels and acute ward needs may always be prioritised, creating barriers [21]. Parallel to the competence enhancing programme, the municipal managers led a reorganisation of the community healthcare services with the goal of improving task sharing among nursing staff. RNs were reorganised into nursing teams while ANs were given more responsibility and independent tasks. These organisational changes helped make it a priority for managers to urge nursing staff to participate in the different learning activities offered through the programme. This collective focus may also have enhanced the ability of the staff to take part and thus their ability to enhance their competence, and because new tasks and responsibilities for ANs were part of the reorganisation, this may have encouraged ANs to participate in the intervention.

The present study did not measure job performance, self-efficacy or job satisfaction, but the level of AN participation in the learning activities, as well as the increase in competence amongst the ANs in this study, is promising in terms of these outcomes. A Swedish study of healthcare



assistants in community healthcare found that on-the-job training with good guidance was just as important as formal education for gaining competence [23]. Similar results were found in another study on caring for patients with home mechanical ventilation [24]. With current and future shortages of health personnel in community healthcare in mind, we believe that ANs' job performance may have a ripple effect on community healthcare and that lifelong learning is important for maintaining a sufficient level of competence. Furthermore, it is important to facilitate discussion and sharing experiences on more simulation-based training to further improve learning results and self-efficacy (Liao, Liang, Chu & Huang, 2022), as other studies have shown that increased job performance leads to better self-efficacy, job satisfaction and lower turnover [11, 25].

### Methodological considerations

ANs in the nursing home were the first to take part in the intervention. For them, it took over a year between round 1 and round 2. The main reason for this is the COVID-19 pandemic, which created a high workload for nursing staff, including these ANs, who had to prioritise other work tasks. The other two groups had more compressed timelines: 9 months for RNs in the nursing home and 6 months for the nursing staff in the rehabilitation unit. These circumstances might have influenced the results in terms of allowing for more time for ANs and less time for RNs to take part in competence enhancing activities.

After the first group had completed the assessment form, there was feedback that the survey was very extensive and took a long time to complete. The survey is indeed extensive, and probably a major explanation to the relatively low rate of completion in round 2. Despite the low completion rate in round 2, the statistical analysis showed significant results. However, extrapolating of the results to a larger population would be unjustified. Further studies with the NOP-CET should find ways to increase completion rate to compare these findings with large, representative samples.

The entire study took place under restrictions and limitations due to the COVID-19 pandemic. Competence enhancing activities were therefore mainly digital. In the autumn of 2021, one in-person course in transfer techniques was conducted. The remaining competence activities were e-learning courses, lectures, supervision, vocational training and meetings with a superior. Digital learning activities were initially thought of as a substitute for in-person learning activities, but as our discussion suggests, this seems to have been a strength of the study

and can offer lessons for future competence enhancing programmes.

### CONCLUSION

This study reports from a municipality in Norway that implemented a competence enhancement programme for all its institutional nursing staff during the COVID-19 pandemic. Because competence gaps had been identified, the nursing staff were encouraged to complete targeted competence enhancing activities with the aim of enhance competence in identified areas. The learning activities were blended and consisted of e-learning courses, lectures, supervision, vocational training and meetings with a superior. The results provide insight into the competence development of RNs and ANs in institutional community health services. They show that a workplace-based blended learning programme improved competence significantly, especially for ANs.

Recommendations for further research are twofold. First, it is necessary to find ways to increase the participation of nursing staff, particularly RNs, both in the competence measurements but also in the competence enhancing activities. A large-scale replication of this study is recommended, preferably with a shorter measurement instrument. Second, research into how nursing staff learn, including the learning preferences of current nursing staff, is of the utmost importance for understanding how to develop effective and sustainable lifelong learning programmes in community healthcare.

Relevance to clinical practice: This research is relevant for clinical practice as it highlights the importance of workplace-based learning with experiences that we all went through during the pandemic. The struggle for educated and competent health personnel is a global one, and effective and sustainable ways to enhance competence as well as retain competent health personnel are of utmost importance.

### AUTHOR CONTRIBUTIONS

In accordance with the Vancouver recommendations, the authorship of this manuscript was determined based on substantial contributions to the conception and design of the study, data acquisition, analysis and interpretation, critical revision of the manuscript and final approval of the version to be published.

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## CONFLICT OF INTEREST STATEMENT

None of the authors has a conflict of interest to disclose.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

## ETHICS STATEMENT

This study was conducted in accordance with ethical standards for scientific research.

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