The potential for learning within hospital learning communities: the interplay between nursing practice and education to support research ability

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Abstract

Objectives: Nurses must contribute to the development of professional practice and thereby improve quality of care by using their research abilities. Therefore, learning communities comprised of nurses, students and teachers were created in a hospital.
Methods: A qualitative descriptive methodology was used. Three learning communities were purposefully selected, and members were asked open-ended questions about their learning and activities in multiple data collection sessions. Data were analyzed by means of an inductive process.
Results: Both individually and collectively, members learned about research in general, research terminology and methods. They learned about asking questions and critical thinking, and, specifically through collective learning, they learned about the differences between education practices. Activities were carried out primarily to continue personal learning.
Conclusions: Learning within the learning communities was mainly research-oriented and therefore potentially suitable for enhancing research ability. Implications are offered to support the formulation of community activities.

Keywords: learning community; learning potential; nursing education; research ability.

Introduction

Currently, nurses need to not only be equipped for complex patient care but also take responsibility for the ongoing improvement of the quality of care (Bouchaud, Brown, & Swan, 2017; Handwerker, 2012; Institute of Medicine, 2011; Kaljouw & Van Vliet, 2015). In the revised Dutch nurse education profile 'Bachelor of Nursing 2020', it is specifically mentioned that nurses and students must contribute to the development of professional practice and that they should be given the opportunity to improve quality of care by using their research abilities. The creation of learning communities (LCs) has therefore been suggested as a way to bring nurses, students and teachers together within practice settings where they can learn, investigate and develop professional practice regarding healthcare challenges (Hanze University of Applied Science, 2018; Landelijk Overleg Opleidingen Verpleegkunde, 2016). Despite the attention given to LCs, the concept is barely elaborated on in the aforementioned profile.

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Nevertheless, a large and growing body of literature has focused on LCs within the education context. First, several studies have explored so-called professional LCs developed based on learning organization theory (Huffman et al., 2015; Sai & Siraj, 2015; Vangrieken, Meredith, Packer, & Kyndt, 2017), which originated from Senge's work (1990). Within these LCs, teaching professionals operate as a collective by sharing knowledge and critically interrogating their practice to promote professional development and student learning (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006). Second, much attention has been focused on student participation in LCs. In this case, several authors (e. g., Goodsell Love, 2012; Shochet et al., 2019; Smith, Shochet, Keeley, Fleming, & Moynahan, 2014) have referred to LCs as intentionally designed groups of students and/or faculty who actively engage to promote and maximize learning (Lenning & Ebbers, 1999).

Previous studies have indicated that both types of LCs have benefits, such as the changing teaching culture (Dogan, Pringle, & Mesa, 2015) associated with a focus on student learning and student achievements (Lomos, Hofman, & Bosker, 2011; Vescio, Ross, & Adams, 2008) or the positive impacts on community members' relationships (Champaloux & Keeley, 2016; Frosch & Goldstein, 2019), the learning environment (Smith et al., 2016) and satisfaction (Wagner et al., 2015). Some studies have also paid attention to LCs in healthcare contexts, for example, regarding the recruitment of nurses (Bassi & Polifroni, 2005) or healthcare innovations (Carpenter et al., 2018).

However, little is known about LCs comprised of nurses, students and teachers situated outside school contexts, in which they learn together and create opportunities to use their research abilities to develop their professional practice. Since LCs within school contexts seem potentially suitable for critical investigation of practices and the promotion of both collective and individual learning (Lenning & Ebbers, 1999; Stoll et al., 2006), it is interesting to examine non-academic LCs from this perspective. Therefore, this study investigates three LCs in a hospital and the potential for learning within these LCs.

Method

A qualitative descriptive approach was chosen to examine the following questions. (1) According to the members, what is learned individually and collectively during the learning community sessions? and (2) According to the members, what activities are initiated after participating in the learning community sessions? This chosen approach, as described by Sandelowski (2000, 2010), allows for open-ended data collection and textual analysis and produces a straightforward description of the research matter, using participants' own words and staying close to the data.

Setting

Since 2016, three LCs were established in care innovation units of the surgery, pulmonary and gastroenterology wards in a large hospital in the Netherlands. A care innovation unit integrates care, education, innovation and research (Snoeren & Frost, 2011; Snoeren, Volbeda, Niessen, & Abma, 2016) and offers internship positions for periods of 20–40 weeks to multiple nursing students of different academic years at the same time. Students follow a secondary vocational educational program to become a registered nurse at the diploma level, or they enroll in a higher professional educational program to obtain their bachelor's degree. In addition, work-scholarship positions are also offered by each ward to higher professional education students who are employed by the hospital. All programs take 4 years to complete. The purpose of the LCs within these units is to periodically bring nurses, students and teachers together so they can share new knowledge and develop through interaction to improve their practice.

Prior to the introduction of the LCs, the stakeholders (the chief nurse officer, education manager, nurse teacher and staff nurses) participated in preparatory sessions to reach a consensus regarding the facilities,

financial resources and cooperation with respect to the LCs. In addition, the staff nurses, students and a nurse teacher discussed the purpose of the LCs to generate a collective view regarding learning culture, the goals and the intended learning outcomes (Wallner & Heemskerk, 2017). Subsequently, these initiators started to meet periodically.

A first informational meeting prior to the study was organized in September 2017 with the nursing practice supervisors of each care innovation unit, the nurse teacher and the principal researcher. To maximize the understanding of the potential for learning within LCs, all three available LCs were purposefully selected based on their design; in each community, a maximum of 15 members participated, and a 2-h session was organized in meeting rooms in a designated part of the hospital once every 4 weeks. All sessions started with a summary of the activities undertaken by the members since the last session (e. g., applying acquired knowledge to a practical issue, helping others or preparing for the next session). Then, the members discussed issues related to their daily practice, such as informal caregiver burden or the improvement to nurses' reporting methods, as well as topics related to research and quality of care. Finally, the members evaluated verbally and in writing what they learned and formulated follow-up activities. Although the session start, session duration and facilities were similar for each LC, the members of each LC were responsible for the content of the sessions, and the session content was therefore different among the communities.

Participants

The population of this study consisted of attending LC members during the sessions, working in one of the three participating wards (Table 1). Third-year interns (higher professional education), fourth-year interns (secondary vocational education and higher professional education) and students with work-study scholarships were part of the LCs because their curricula contained specific practical tasks related to research or the improvement of quality of care. The pulmonary ward only accepted higher professional education students, who were therefore part of the LC.

Self-selected experienced staff nurses, a nursing practice supervisor and a nurse teacher were also LC members. Additional tasks of the nursing practice supervisor were time monitoring and keeping the minutes during the sessions. Support for learning and research processes was provided by the nurse teacher, who stimulated dialog between the members, suggested didactic methods and shared expertise. This teacher was not responsible for the assessment of the students or other participating members. Depending on the topic of the group discussion points, experts were invited by the members to join a session. These experts were excluded from the study because they did not participate consistently. Some invited members did not

Table 1: Overview of the attending surgery (S), pulmonary (P) and gastroenterology (G) learning community members by session.

Members	Session 1			Session 2			Session 3			Session 4			Session 5			Session 6		
	S	P	G	S	P	G	S	P	G	S	P	G	S	P	G	S	P	G
Interns-hpe	4	5	4	4	4	4	4	4	4	4	4	4	5	6	4	5	5	3
Interns-sve	2	0	2	2	0	2	2	0	2	2	0	1	2	0	1	2	0	1
Students	3	0	2	2	2	2	2	4	1	2	3	0	2	3	0	2	4	0
Staff nurses	1	2	1	2	2	2	4	3	1	2	1	2	2	1	2	2	1	2
Educators	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Experts	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2

Interns-hpe: higher professional education interns (3rd and 4th academic years). Interns-sve: secondary vocational education interns (4th academic year). Students: higher professional education students with work-study scholarships (3rd and 4th academic years). Staff nurses: experienced staff nurses. Educators: nursing practice supervisor, nurse teacher. Experts: excluded from the study because they did not participate consistently.

participate during all sessions due to illness or (school)work. In addition, three students did not attend all the sessions because they prematurely left their care innovation units for personal reasons.

Data collection

Data were collected between September 2017 and September 2018 during a total of seven sessions of each LC (a total of 21 sessions). First, data were collected at the end of six sessions of each LC (a total of 18 sessions), and members were asked to answer three open-ended questions in a group context: (1) What is the most important thing that you have learned?; (2) What is the most important thing that the group has learned?; and (3) Based on the knowledge you have gained, what are you going to work on? The members noted their answers to the three questions on paper and were asked to share one of their answers with the group. The noted answers were gathered and later digitally processed to indicate the number of similar and common answers from members during the different sessions. In addition to the answers to the three questions, session minutes and invitations to the next session were collected to document the members' activities. In the seventh session of each LC, data collected during the previous six sessions were checked by asking members to respond verbally to the first results.

Additionally, a group interview took place (n=12, n=7 and n=6) during the seventh session to further explore the members' points of view and to deepen the meaning of their experienced outcomes. Finally, a member check meeting with a smaller group was performed, consisting of one nurse from each of the LCs and the nursing school teacher. By sharing their insights gained in each LC, insights were brought into relation with each other, and the results were validated. The audiotaped interviews and final member check meeting were transcribed.

Data analysis

All data related to the first two open-ended questions (What is the most important thing that you have learned? What is the most important thing that the group has learned?) were subjected to an inductive analysis process (Saunders, Lewis, & Thornhill, 2016) to identify themes through repeated examination and comparison. All answers to these two questions were grouped according to content by the principal researcher. Subsequently, the groups of answers were independently labeled by the principal and second researcher. The labeled groups of answers given in 12 of the 18 sessions were discussed by the researchers. Differences and similarities in the labels were explored to reach agreement, resulting in a list of 40 labels for question one and a list of 32 labels for question two. These lists were used to label the six remaining sessions.

All answers to the third question (Based on the knowledge you gained, what are you going to work on?), the session minutes and invitations to the next session were labeled independently by both researchers using five labels related to activity objectives. These five labels were based both on obtained insights during the analysis process of the first two questions and the literature concerning community activities that was additionally studied. The labels were created in advance by the principal researcher and reviewed by the second researcher: (1) personal learning, (2) learning of others, (3) mutual learning, (4) practice contributions and (5) development of knowledge products.

Furthermore, the occurrence and frequency of each label in the data for each session were schematically depicted. Subsequently, both researchers analyzed which labels were the most common in the data from all three LCs. Regarding the variety of labels related to the first two questions, these labels were further categorized based on relevant literature.

The analysis of the group interviews (the seventh session of each LC) was performed according to the three phases described by Miles and Huberman (1994). First, the spoken reactions of the members were transcribed verbatim. Subsequently, the researchers selected the most meaningful citations for the interpretation of the data. Next, the citations were labeled and merged schematically. Finally, the researchers explored the

relations between the labeled citations and the other labels (the labeled question responses and labeled members' activities) in the dialog. The transcribed member check citations were selected and used to supplement, nuance or confirm the data collected from the LC sessions.

Quality procedures and ethical considerations

To enhance the quality of the research, several procedures were undertaken (Lincoln & Guba, 1985). The principal researcher participated as a community member in each LC. Through this prolonged engagement, context orientation and direct access to data sources were possible. Triangulation of data and methods was achieved, and several member checks were accomplished. Furthermore, two researchers were involved which encouraged peer debriefing and the exploration of the data from different perspectives. Group interviews and member check meetings were led by the second researcher (second author) to prevent any influence of the principal researcher on the members. During the analysis process, researchers kept notes to substantiate choices made. In addition, the level of agreement between both researchers in labeling the collected answers by using the lists of labels was calculated by Cohen's kappa. For this, the lists of labels for questions one and two and the five labels used for question three were transformed to numeric codes. The interrater reliability values were κ 0.88, κ 0.97 and κ 0.797. According to the guidelines of McHugh (2012), the calculated values of all three lists indicated a strong to almost perfect level of agreement between the two researchers. Finally, the findings were peer reviewed by two independent researchers (third and fourth authors).

The director of the academy of the hospital granted permission for the collection of data, and the Science Bureau approved this study. Prior to the study, members of the LC were informed about the nature of the study and the voluntarily nature of their participation. Informed consent was obtained from the community members for their participation in the group interviews and the member check meeting and the audio recording of these meetings. After the researchers collected the data, data processing was done anonymously so the data could not be traced to individuals.

Results

The results are presented for each research question individually, namely, (1) individual and collective learning and (2) activities of the LC members. Where applicable, the results are supplemented with quotes and referred to session number and first letter of the LC's name.

Individual and collective learning

Regardless of the LC or session, the results of members' individual and collective learning can generally be divided into two main categories: research and an inquiring attitude. The "research" category mainly concerns answers and quotes regarding conducting research. Data that reference attitudinal traits are included in the "inquiring attitude" category. As shown in Tables 2 and 3, community members reported that they learned both individually (50.00%) and collectively (50.22%) about components related to research.

For each of the three LCs, it appears that members individually learned the most about research in general and different methods of research, such as "the difference between triangulation and mixed methods" (session 1_P) or "qualitative and quantitative research methods" (session 2_S). They also learned about research terminology, such as the meanings of "generalization" (session 2_S), "validity" (session 2_G) and "transcription" (session 3_P). Members learned about research terminology by sharing relevant knowledge.

> "(…) so, I also like to hear more about what they [students] are doing, and you also learn from them about research, terms and so on." (session 7_nurse_S)

Members of the pulmonary and surgery LCs learned about formulating a research question.

> "(…) we looked at my research question, and we talked about methods, which I liked very much." (session 7_student_P)

In all three LCs, members individually learned about data analysis and follow-up research, for example, "which data analysis fits within the research problem" (session 1_G) and "that previous research offers plenty of research opportunities" (session 4_P). Other research components that were learned varied between the communities. Members of the pulmonary LC, for example, learned about components such as discussions and conclusions, while members of the other two LCs learned about data collection. During the member check meeting, it was confirmed that not all research components had been discussed in each LC. The group discussion points and session content depended on the input of the members.

> "Because you can, of course, regularly design the sessions yourself. So, I think the question was, 'How do I develop a survey?' or 'How do I create a topic list?' or something… this was emphasized." (member check_nurse_G)

In addition to individual learning about research, Table 2 demonstrates that LC members also learned individually about the traits of an inquiring attitude (25.93%). Based on the results of individual learning, asking questions was mentioned frequently (10.19%). Members learned about "ways to ask questions" (session 5_S) and about different types of questions, such as "asking high-level and low-level questions" (session 1_G).

Table 2: Overview of a selection of categorized labels related to 'individual learning'. What is the most important thing that you have learned?.

Code	Label	Surgery	Pulmonary	Gastroenterology	Subtotal	Total
10	Research	3.70%	3.24%	2.31%	9.26%	
4	Research question	1.85%	3.24%	–	5.09%	
7	Research method	1.85%	2.78%	1.39%	6.02%	
8	Data collection	1.85%	–	2.78%	4.63%	
9	Data processing	–	0.46%	0.46%	0.93%	
13	Data analysis	0.46%	1.85%	1.85%	4.17%	
18	Research terminology	0.46%	3.24%	0.93%	4.63%	
22	Research instrument	1.39%	–	2.31%	3.70%	
24	Results	0.46%	–	0.46%	0.93%	
25	Follow-up research	0.93%	0.93%	0.93%	2.78%	
27	Conclusion	–	1.85%	–	1.85%	
29	Discussion	–	1.39%	–	1.39%	
35	Problem analysis	2.78%	–	0.46%	3.24%	
38	Literature search	0.93%	0.46%	–	1.39%	
						50.00%
1	Inquiring attitude	0.93%	–	0.46%	1.39%	
3	Asking questions	4.17%	4.63%	1.39%	10.19%	
5	Making arguments	1.39%	–	0.46%	1.85%	
12	Being critical	3.24%	1.39%	1.39%	6.02%	
14	Sharing knowledge	0.93%	0.46%	1.39%	2.78%	
15	Being open-minded	–	–	0.46%	0.46%	
19	Listening	0.93%	0.46%	–	1.39%	
30	Presenting	0.46%	0.93%	0.46%	1.85%	
						25.93%
	Uncategorized					24.07%

N: 216 labels – κ: 0.88. From the 40 label options, only a relative number of labels belonging to the two main categories (research and inquiring attitude) or that stand out are presented.

In all three LCs, members reported having learned individually about being critical and critical thinking, for example, when members cooperated with each other.

"Well, during that research period, it is just very useful to get the critical view of others." (session 7_student_P)

Table 3 provides an overview of labels regarding what members learned collectively. Similar to individual learning, in terms of collective learning, the members in all three LCs learned the most about research methods, followed by research in general. Other related components varied by LC. Furthermore, it was found that the members of all three LCs learned collectively about traits of an inquiring attitude, mainly regarding asking questions. This outcome is similar to that of the individual learning of the members. In addition to learning about ways of asking questions and different types of questions, community members learned collectively about applying questions.

"Exactly, I had presented my research in the first session, and others had to pose questions to examine how it went and how … " (session 7_student[a]_S) "…and that was usable for you and for us." (session 7_student[b]_S)

In addition to learning about research and an inquiring attitude, members noted other answers that they learned about collectively. During the first few sessions, they collectively learned what an LC is and what the members could expect from it. They learned about "how an LC functions and its purpose" (session 1_P) and the

Table 3: Overview of a selection of categorized labels related to 'collective learning'. What is the most important thing the group has learned?.

Code	Label	Surgery	Pulmonary	Gastroenterology	Subtotal	Total
10	Research	3.52%	0.44%	3.52%	7.49%	
4	Data collection	1.32%	0.88%	0.88%	3.08%	
5	Problem analysis	2.20%	–	–	2.20%	
6	Research method	2.64%	3.08%	4.41%	10.13%	
9	Literature search	2.20%	–	–	2.20%	
11	Research terminology	–	2.20%	–	2.20%	
12	Data analysis	1.32%	2.20%	0.88%	4.41%	
13	Results	–	1.32%	–	1.32%	
14	Conclusion	–	1.32%	–	1.32%	
15	Discussion	–	1.32%	0.88%	2.20%	
16	Research question	1.32%	3.96%	–	5.29%	
20	Follow-up research	1.32%	2.20%	–	3.52%	
21	Research instrument	0.88%	–	2.20%	3.08%	
22	Data processing	–	0.44%	0.88%	1.32%	
30	Research background	–	0.44%	–	0.44%	
						50.22%
	Inquiring attitude					
2	Asking questions	4.41%	6.61%	2.20%	13.22%	
18	Listening	0.88%	–	0.88%	1.76%	
23	Being critical	0.88%	1.76%	–	2.64%	
25	Sharing knowledge	0.88%	0.88%	1.76%	3.52%	
27	Being open-minded	–	0.44%	–	0.44%	
28	Making arguments	0.44%	–	–	0.44%	
						22.03%
1	Learning community	3.08%	2.64%	0.88%	6.61%	6.61%
3	Insights into assignments	4.41%	–	1.76%	6.17%	6.17%
	Uncategorized					14.98%

N: 227 labels – κ: 0.97. From the 32 label options, only a relative number of labels belonging to the two main categories (research and inquiring attitude) or that stand out are presented.

required environment, such as "a safe environment in which we work collaboratively regarding the project" (session 1_G).

In contrast to the pulmonary LC, the members of the surgery and gastroenterology LCs collectively developed insights into the different curriculum assignments of the students. Collective learning mainly focused on the differences between the curricula and the corresponding assignments (session 5_G). These differences were described as difficult by the members due to dissimilarities between assignments.

> "It was difficult to follow, but eventually it improved. We both really benefitted from it." (session 7_student_S)

During the member check meeting, it was mentioned that curriculum assignments should be shared at an earlier stage.

> "(…) we should have included the secondary vocational education students earlier by sharing their assignments." (member check_teacher_university of applied science)

Activities of the LC members

Table 4 shows that more than two-thirds of the activities (72.56%) were focused on the continuation of members' personal learning. These activities reflected what members learned during the sessions. Answers included "completing my project in stages" (session 4_G), "preparing for my presentation and discussion" (session 5_P) or "exploring which method is suitable for my research" (session 1_S). The documented activities were primarily individual activities, for instance, creating a survey based on the previous session and applying it for one's own assignment (session 2_G). Among all the activities, 14.51% focused on mutual learning, for example, the preparation of a session, during which novel insights and information were shared with other members. Subjects that were prepared for the sessions included different methods of data collection (session 1_S) and the analysis of raw data (session 2_P).

Table 4: Overview of labels related to 'activities of the learning community members'. Based on the knowledge you gained, what are you going to work on?.

Code	Label	Surgery	Pulmonary	Gastroenterology	Subtotal	Total
1	Personal learning					
	Planned	21.77%	19.87%	14.83%	56.47%	
	Undertaken	7.57%	2.84%	5.68%	16.09%	
						72.56%
2	Learning of others					
	Planned	1.58%	0.63%	0.32%	2.52%	
	Undertaken	0.63%	0.95%	0.63%	2.21%	
						4.73%
3	Mutual learning					
	Planned	1.89%	1.89%	1.26%	5.05%	
	Undertaken	2.21%	2.84%	4.42%	9.46%	
						14.51%
4	Practice contributions					
	Planned	0.95%	0.63%	0.63%	2.21%	
	Undertaken	0.32%	0.32%	–	0.63%	
						2.84%
5	Knowledge products					
	Planned	1.26%	1.58%	0.63%	3.47%	
	Undertaken	0.95%	0.32%	0.63%	1.89%	
						5.36%

N: 317 labels – κ: 0.797.

A minority of activities, less than 5%, focused on the learning of others or contributions to practice (Table 4). Activities focused on the learning of others were mainly related to supporting other members, such as "asking critical questions about assignments" (session 1_P) or discussing each other's measurement instruments (session 3_G). Activities for daily practice were seldom planned activities related to the application of research or implementation strategies in the ward (session 6_P) but more often were related to the preparation and introduction of new members, for example, "being prepared for new interns" (session 4_S).

A small number of activities were focused on designing follow-up research (session 4_S) and developing research agendas (session 4_ P). As a result, research agendas and follow-up research were acknowledged as shared knowledge products. In addition, the products generated by students individually through their studies were considered products for the purpose of daily practice.

> "Yes, on our ward a student created a card to systematically transfer information, say, for the transfer of information from the evening shift to the night shift" (member check_nurse_S)

In return, these products contributed to personal learning and a sense of cooperation.

> "Due to the research agenda, it's so much easier for yourself." (session 7_student_P)

> "The research here is supported; there is a demand, so you know that there is cooperation (…)." (session 7_ student_S)

Discussion

This study shows that LCs in the context of hospital practice enhance the individual and collective learning of the participating members. The results indicate that the learning in the LCs in this study was mainly research-oriented. In addition to learning about research in general and research terminology, the members gained novel insights mostly about different research methods but also about the formulation of research questions, data collection and analysis and follow-up research. According to Saunders et al. (2016), these are stages of the research process that a researcher goes through to find an answer or a solution. Although bachelor students and professionals, such as nurses, do not have to become researchers, they should develop the ability to conduct their own research that results in the production of new knowledge and professional products (Andriessen & Greve, 2014; Landelijk Overleg Opleidingen Verpleegkunde, 2016). Previous studies have shown that nurses are motivated to conduct research but that they often experience impediments, such as lack of designated time (Berthelsen & Holge-Hazelton, 2015; Koster, Bonnema, Brusse-Keizer, & Borghuis, 2018). The current study illustrates that LCs with teacher collaboration facilitate nurses' and students' production of research knowledge and assists them in applying this knowledge in tasks related to research and quality of care. This likely suggests that the LC members were motived to learn about research because the sessions had sufficient time for such research-oriented learning.

Furthermore, the results indicate that members frequently learned about asking questions. In particular, knowledge about asking questions was developed and applied during the sessions. Asking questions likely involves the development of two traits of an inquiring attitude: being critical and wanting to know. According to Van der Rijst (2009), these two traits are associated with curiosity and sophisticated doubt, which lead to critical questioning about all kinds of issues. Other studies have also noted the importance of asking questions to promote critical thinking (Abrami et al., 2015; Renaud & Murray, 2006), which is crucial for nurses to solve problems and make clinical decisions (Makhene, 2017; Pitt, Powis, Levett-Jones, & Hunter, 2015). Additionally, the results show that members learned to make arguments, present outcomes and have an open mind. These activities suggest the development of knowledge sharing among the members, which is also related to an inquiring attitude (Van den Herik & Schuitema, 2016; Van der Rijst, 2009).

The findings of this study mainly related to two of the three characteristics of research ability: conducting one's own research and possessing an inquiring attitude (Andriessen & Greve, 2014; Van den Berg, 2016). It is

therefore suggested that LCs in hospitals may be suitable to address the research abilities of nurses and students in professional practice.

This study cannot make a clear distinction between what is learned individually and what is learned collectively regarding research knowledge and an inquiring attitude. This inability may be related to the open nature of the data collection or to the complexity of learning within communities situated in professional practice. Snoeren (2015) described workplace learning as a complex and ongoing process in which both individuals and the environment change and adapt, create and evolve in relation to each other. Similar processes occur in LCs, which are described as complex and contextual (Vescio et al., 2008). Learning in LCs might take place similarly to workplace learning, i. e., within holistic, relational and dynamic spheres rather than at static and clearly defined learning levels (Snoeren, 2015). It is conceivable that the members were not able to distinguish between individually and collectively achieved research knowledge and attitudinal traits due to the mutual influences between learning levels.

In this study, group discussion points and the content of the sessions depended on the input of the members and were mainly research-oriented. Despite the open nature of the LCs, it is conceivable that the input of the members was influenced by their shared vision and goals and the involvement and active support of stakeholders, which are important conditions for an LC to function (Huffman et al., 2015; Stoll et al., 2006). Shared visions and goals among the community members may have been determined by the composition of the group; all participating members, including the participating teacher, conducted research themselves or contributed to the research of others. In addition, stakeholder support to help create an LC for the same purpose may also have had an impact. It seems plausible that when these communities consist of members with a shared vision and goals and are supported by stakeholders, the input and learning of the members will tend toward a certain direction, which, in this case, was a mainly research-oriented direction.

Two LCs, i. e., the surgery and gastroenterology LCs, learned collectively about the content of various assignments to gain insight into the differences among them. According to the literature, differences between practices that give rise to discontinuities in interaction and action are defined as boundaries (Akkerman & Bakker, 2011). Readjusting these discontinuities requires efforts that entail learning potential (Bakker & Akkerman, 2013; Tuomi-Gröhn, Engeström, & Young, 2003). Although the question remains to what extent sufficient effort was made during the sessions in this study, the results illustrated that members responded to the differences by learning collectively about each other's assignments. It can thus be suggested that when different educational practices come together, such as practices from different education levels, an LC offers the possibility to bridge boundaries with the potential for collective learning.

This study provides insight into the individual and collective learning of the community members during the sessions, where learning was mainly related to research knowledge and attitudinal traits. Within the scope of this study, the findings do not provide insight into how members actually applied the research knowledge and attitudinal traits to improve their professional practice. This can be explained by the fact that LCs mainly occur through learning from reflective dialog and inquiry (Stoll et al., 2006; Vangrieken et al., 2017). Although preliminary findings have been reported in the literature that learning within LCs can directly contribute to improving healthcare (Carpenter et al., 2018), the results of the current study cannot deny or confirm this. Nevertheless, the members acquired new knowledge and attitudinal traits, and they perceived that others contributed to their learning and that they accessed new research methods. Wenger, Trayner, and De Laat (2011) stated that not all of the value produced by a community is immediately realized. Activities and interactions can produce "knowledge capital" whose value lies in its potential. Even if situations in which members can apply their new knowledge never occur, it is useful and reassuring to have this knowledge in case such situations should arise.

Limitations

This study has several strengths, such as the specific research context of LCs in hospitals, the extent to which the findings could be objectified (interrater reliability) and the triangulation of the data. Despite its strengths,

the study also has limitations. First, providing answers on paper does not directly lead to in-depth information. Thereby, the answers to the evaluative questions reflect the perceptions of members immediately after a session and do not reflect their long-term perceptions or activities, which can lead to biased descriptions. However, triangulation was applied to increase the validity of the results through document analyses, group interviews and member checks.

Second, the principal researcher was also a participating community member within all three LCs. Although a nursing practice supervisor and nurse teacher facilitated the discussions and other work, a risk of influencing the members in the desired direction with regard to the evaluation remained. Therefore, additional data during the group interviews and the member check meetings were collected by a second independent researcher. The independent coding process confirmed the content of the data and ensured the reliability of the results.

Third, the results only reflect each LC as a whole but do not represent individual respondent groups within the LCs, such as students, nurses and educators. Additionally, the participation of staff nurses in these LCs was voluntary; therefore, these individuals might be more willing to learn about research, and their inquiring attitude might be greater than the average. Furthermore, due to the presence of a teacher and the integration of the students' curriculum assignments, there is a possibility that the dialogs during the sessions were driven by the educational requirements. Although the members themselves were responsible for the content of the sessions and the teacher was not responsible for the assessment of the students, further research should include the collection of data for distinct respondent groups.

Finally, a limitation is that the study was conducted in a single Dutch hospital and must therefore be read in this specific context. Nevertheless, the study was carried out within three care innovation units, a clinical education model that has also been implemented within other hospitals and healthcare institutions. This study offers the opportunity for other hospitals to gain knowledge about the potential for community learning for nurses and students in collaboration with teachers. In addition, this study offers hospitals and other healthcare institutions guidelines to develop community learning related to the research abilities of nurses and students in collaboration with teachers in practical contexts.

Conclusion

This study shows that LCs in hospitals contribute to individual and collective learning and are suitable as a learning approach in professional practice, especially for promoting research knowledge and attitudinal traits. Hospital LCs that involve collaboration with teachers are useful to increase nurses' and students' research abilities. Furthermore, the study suggests that learning during LC sessions depends on the input of the members, which is conceivably influenced by the group composition and stakeholders, which may also lead to other relevant learning directions. The learning within these communities is likely enhanced by bringing different practices together and bridging boundaries between them. Individual and collective learning does not naturally lead to activities that contribute to professional practice or to several shared professional products. Based on these insights, the following practical suggestions are formulated:

– Create a balance between core activities and boundary processes (Wenger, 2000), specifically in LCs in which different educational practices are integrated. In other words, create a space for dialog and use connecting people, such as nurses or teachers from secondary vocational education, to gain more insight into existing boundaries.
– Generate opportunities to stimulate the transfer of research knowledge and inquiring attitudes toward daily practice. For instance, formulate a research project for several LCs to complete together in which students, nurses and teachers carry out broad-based research and quality of care projects while being encouraged to apply what has been learned during the LC sessions.
– Support members and stakeholders in articulating the goals they pursue and construct a mutual sense of purpose with a specific focus on improving the quality of care. This requires developing usable practical

products, also called boundary objects (Bakker & Akkerman, 2013), that are suitable for both the education system and professional practice.

Further research is necessary to gain more insight into the mutual influences of different learning levels (individual and collective) in LCs and the extent to which learning at both levels can be distinguished. In-depth research into discontinuities in interaction and action may provide more insight into learning at the boundaries within LCs and the resulting potential for learning. Further research can determine whether community members actually integrate research knowledge and an inquiring attitude into their performance when they collaborate, learn and do research together. In addition, action research can contribute to the development and application of broad-based research projects to improve the quality of care through the deliberate creation and application of professional products.

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