

## **How mentoring education affects nurse mentors' competence in mentoring students during clinical practice – A quasi-experimental study'**

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## **Abstract**

Mentors need diverse competencies, sources of motivation and characteristics to successfully mentor nursing students and support students' learning processes. Effective mentoring education can benefit future nursing professionals, students' satisfaction and learning, as well as the general perception of the nursing profession. In this study, we developed mentoring education intended to improve the mentoring competence of nurses.

### **Objective**

The purpose of this study was to evaluate how an educational intervention affects nurse mentors' competence in mentoring nursing students during clinical practice.

### **Design**

A quasi-experimental study design with pre- and post-tests was used.

### **Settings**

Educational interventions were conducted in one university hospital and two central hospitals in Northern Finland between 2013-2017. The intervention was conducted twice per year with a duration of three months for each group. The inclusion criteria for the participants were: volunteer participation to mentor education employment at the university hospital or central hospitals in Northern Finland.

### **Methods**

The intervention aimed to increase registered nurses' competence in mentoring nursing students. The education lasted three months and included online learning as well as three face-to-face teaching sessions. A total of 120 nurse mentors completed the Mentor Competence Instrument (MCI), which includes 10 sub-scales that describe various competence areas, before and after the education.

### **Results**

Nurse mentors' mentoring competence increased across all mentoring competence areas after the educational intervention. More specifically, the participating nurses showed a statistically significant increase in their competence regarding knowledge of mentoring practices in the workplace, student-centered evaluation, identifying student needs, mentoring practices between mentor and student, supporting students' learning processes, goal-orientation in mentoring and constructive feedback.

## Conclusions

On an international level, nurse mentors are not typically required to have completed mentoring education prior to the mentoring of nurse students. Since mentoring education increased nurses' competence at mentoring nursing students, we recommend that all nurse degree programs include mentoring education to prepare future nurses for the important future role in mentoring. It is the responsibility of organizational leadership to offer continuous education for nurse mentors to develop their mentoring competence.

Keywords: clinical practice, educational intervention, mentor, nurse, environment, student

## INTRODUCTION

Clinical practice encompasses a significant part of the nursing degree program and provides students with the opportunity to learn important practical skills (HWA, 2013). This part of nursing students' education is carried out in authentic clinical environments and students are mentored by registered nurses (EU Directive 2013/55, 2013). Mentors are vital to supporting the professional growth of nursing students (Hilli et al., 2014; Jokelainen, et al., 2011; McIntosh et al., 2014; Omansky, 2010). For this reason, nurse mentors need diverse competencies if they are to successfully mentor nursing students during their clinical practice, e.g. the ability to support students' learning processes, identify students' competencies and set individual learning outcomes, as well as provide feedback and constructive evaluation (Authors names blinded). A competent mentor can facilitate students' learning processes in clinical practice and enhance students' knowledge through constructive guidance. Nurses have previously stated that they need to improve their clinical mentoring skills and have requested more support for mentoring students (Kalisschuk et al., 2013). Another study showed that continuing mentoring education can increase nurse mentors' competence (Omansky, 2010; Wu et al., 2018). Moreover, improvements in mentors' competence are expected to positively influence how prospective nursing students will view the profession (Kalisschuk et al., 2013).

Mentors are internationally referred to as facilitators, peer instructors, preceptors (Walker, et al., 2012), clinical guiders (Quattrin et al., 2010), clinical instructors (Glynn et al., 2017) and/or supervisors (HWA, 2013). In this study, a mentor is defined as a registered nurse who supports, teaches and assesses undergraduate nursing students during their clinical practice. Commonly mentors are not employed by the educational provider. Furthermore, in many European countries mentors are not required to complete any mentoring education prior to their mentoring of a student (Dobrowolska et al., 2016). Nevertheless, there is evidence that mentoring education increases

mentors' confidence in their knowledge and skills, providing and receiving feedback, assessing learning styles and handling challenging situations, as well as helps them understand the roles and responsibilities of a mentor (Wu et al., 2018). Furthermore, the completion of specific education influenced mentors' attitudes towards the mentoring of nursing students (Russell et al., 2017) and was shown to result in more satisfied mentors (Senyk and Staffileno, 2017). Another recent study showed that mentoring education which employs evidence-based teaching can decrease costs and standardize processes (Senyk and Staffileno, 2017).

Mentoring education varies greatly between countries and there is currently no consensus regarding the minimum qualifications or required competencies for mentors in clinical practice (Dobrowolska et al., 2016). This fact, along with the finding that mentoring competence can significantly impact a student's learning, makes investigating the competence of nurse mentors in various contexts a relevant topic (Mårtensson et al., 2013; Walker et al., 2012). The Nursing and Midwife Council (NMC 2018) recommended that all mentors should participate in at least 10 days of mentoring education during a three-month program. The NMC recommends that mentors have the minimum level of knowledge from both academic and practical settings, as well as regularly update their competence level through further education. In Finland, the completion of a mentor course or program is voluntary and universities and healthcare organizations, such as hospitals, provide mentoring education (Ministry of social Affair and Health, 2003). The development, evaluation and implementation of mentoring evaluation underlies the success of clinical practice and ensures the provision of quality healthcare by future nurses (Nash and Flowers, 2017).

However, earlier studies revealed that mentors are not aware of the educational requirements and expectations that undergraduate nursing schools have of mentors. Furthermore, mentors have expressed concern about their lack of clinical mentoring education, and some of them neither perceive students nor the responsibility to educate positively (Russell et al., 2017). Other mentors have expressed a need for further educational preparation (Kalischuk et al., 2013). Mentors need support and education from hospitals and universities to develop professionally. Mentoring education generally includes versatile themes, such as the roles and responsibilities of a mentor, adult learning theories, clinical teaching pedagogies, clinical assessment strategies, feedback skills, effective communication (Russell et al., 2017; Windey et al., 2015; Wu et al., 2018), management of challenging situations, and leadership techniques (Wu et al., 2018). In this way, most mentoring education aims to develop mentors' knowledge, skills, and attitudes towards clinical practice mentoring students; hence, the content of the education includes evidenced-based practice, time management, diversity, rewards and benefits and motivation (Windey et al., 2015). Mentoring

education also commonly utilizes virtual environments, as online learning is feasible and more appropriate for continuing education (Chen et al., 2008). Nowadays, continuing education is frequently integrated with technology to increase the flexibility and responsiveness of the nursing workforce (Wu et al., 2018), and mentors have been satisfied with online learning methods (Wu et al., 2018). The educational intervention developed for this study combined online learning and face-to-face teaching sessions. The mentoring education was developed according to evidence-based knowledge (Authors names blinded) and included the pedagogical approaches of socio-constructive learning theories and consultation of mentoring expert panels. We took into account how mentoring education influences mentors' motivation to work with students, and, as such, the educational intervention covered the essential theoretical aspects of mentoring through versatile teaching methods. The purpose of this study was to evaluate how education affects nurse mentors' competence in mentoring nursing students during clinical practice.

## **METHODS**

### **Study design and participants**

The quasi-experimental, non-randomized study was conducted with registered nurses from one university hospital and two central hospitals in Northern Finland. The mentoring education lasted three months and was offered to eight groups of mentors (n=150) during the years 2013-2017. The developed educational intervention targeted registered nurses who were responsible for mentoring nursing students. Researchers recruited study participants during the first day of education in the hospital. The education was available for any registered nurse who was interested in developing their mentoring competence. Any registered nurse who met the credibility criteria could participate in the study. The inclusion criteria for participation were: 1) voluntary participation in mentoring education; and 2) employment at the university hospital or central hospitals in Northern Finland.

### **Procedure and measures**

Data were collected with a questionnaire including demographic questions and the Mentor Competence Instrument (MCI) (Authors' names blinded). The demographic questions (16 questions) included information on mentors such as education, discussion time with students, and role of mentoring. The MCI had been previously developed to assess the mentoring competence of healthcare professionals. The instrument contains ten subscales, identified based on an exploratory factor analysis of the 63 items, namely: 1) student-centered evaluation; 2) goal-oriented mentoring; 3) mentoring practices in the workplace; 4) reflection during mentoring; 5) mentor characteristics; 6) supporting students' learning processes; 7) mentor motivation; 8) identification of students' levels of

competencies; 9) constructive feedback; 10) mentoring practices between student and mentor. Each item is scored using a four-point Likert scale (1= totally disagree, 2= disagree to some extent, 3= agree to some extent, and 4= totally agree). Cronbach`s alpha was used to test the internal consistency of the scales (Polit and Beck, 2011), and varied between 0.703 and 0.891 (see Table 1). MCI has previously exhibited acceptable psychometric properties (Authors names blinded).

The baseline data were collected by paper questionnaire at the beginning of each educational intervention. The post-intervention data were collected with the electronic version of the questionnaire (educational interventions I-III, 2013-2014) or with the paper questionnaire (educational interventions IV-VIII, 2015-2017). All of the measurements were taken in the clinical setting in which the mentor works

## **Intervention**

The mentoring education aimed to strengthen mentors' competence at mentoring students and to improve the quality of mentoring in the clinical learning environment. The duration of the mentoring education was the equivalent of two ECTS (*European Credit Transfer and Accumulation System*) credits defined as continuing education. The theoretical framework for the education was formed according to the latest evidence-based knowledge, including the following three themes: Acting as a mentor (motivation of the mentor, mentoring practices between mentor and student); Mentoring process (goal-oriented mentoring, student-centered evaluation, providing feedback); and Diversity of mentoring (mentoring practices in the workplace, permissive learning environment) (see Table 2).

The education employed socio-constructive learning theory, and the learning methods and assignments were developed with mentoring experts from university and clinical teacher coordinators with versatile learning activities. The mentoring education included three instances of face-to-face teaching (seven hours per time) and online learning (total of 34 hours). The face-to-face teaching was interactive and conversational. All of the teaching sessions had special themes, and the program was designed so that the conversation continued online through a discussion forum. Online learning also included a personal learning diary in which participants reflected on the issues that were studied at face-to-face sessions. The online learning environment included texts, videos and cases that introduced the covered themes to participants. The hospital allowed the participants 29 working hours to participate in the education.

The mentoring education was organized in cooperation with the university hospital and University of Oulu. The clinical teacher coordinators from the hospital and health science teacher candidates, along

with their supervisors, from the university were responsible for teaching and supervision. The mentoring education was arranged twice per year between 2013-2017, and there was a total of eight educational interventions. Each intervention accepted up to 30 healthcare professionals, and this study focuses only on registered nurses.

### **Ethical consideration**

The presented research was conducted in accordance with code of Ethics of the World Medical Association (Declaration of Helsinki, 2013). The permission necessary to conduct the study was obtained in accordance with the policy of each hospital district. Participants received written and oral information on voluntary participation, data protection and confidentiality. Written informed consent was obtained from every participant, and all of the participants were informed that they could contact the researchers if they had any further questions.

### **Data analysis**

Descriptive and statistical multivariate methods were used to analyze the data using the Statistical Package for Social Sciences (SPSS, version 23.0, IBM Corporation, Armonk, NY, USA). The data were analyzed and reported in sample frequencies (f), percentages (%), means, and standard deviations (SD). The MCI sum variables were created based on the ten-factor model validated in an earlier study (Authors' names blinded). A Wilcoxon signed-rank test was used to assess which sum variables demonstrated significant differences before and after mentoring education. Any missing data were replaced by the mean value of the specific variable as long as each item grouped under the variable had lower than 5% missing data. The threshold for statistical significance was set at  $p < 0.05$  (Polit and Beck, 2011). The pre- and post- effect size within a single group was calculated using Cohen's d effect size, which varied from moderate to large (Cohen, 1992; Lakens 2013). For this parameter, values of  $d > 1.3$  represent a very large effect; values of  $d > 0.8$  represent a large effect; values of  $d > 0.5$  represent a moderate effect; and values of  $d > 0.2$  represent a small effect.

## **RESULTS**

### **Baseline characteristics of the participants**

A total of 150 registered nurses participated in the education (Table 3). Out of these nurses, 120 participants answered the pre- and post-test questionnaire. Most of the participants were women (94%), while 35 % had 11 to 20 years of work experience in healthcare (see Table 4). In addition, 24 participants (20%) had previously participated in mentoring education. All of the participants had mentoring experience and 46 % of the participants had mentored students during their last working

week. Most of the participants (87%) reporting engaging in discussion with students for over 21 minutes during mentoring days. The drop outs characteristics of participants did not differ significantly between educational intervention groups, expect their workplaces where mentoring student (See Table 4).

### **Effects of mentoring education**

The mentoring competence of the participants (n=120) ranged from 2.9 (SD=0.50) to 3.8 (SD=0.32) (mean values) before the educational intervention and from 3.2 (SD=0.38) to 3.8 (SD=0.32) (mean values) after the intervention. After the completion of the education, competence significantly increased ( $p<0.05$ ) in all areas except for the sum variables of mentor characteristics, mentor motivation and reflection during mentoring (Table 3). Mentoring practice in the workplace (mean change 0.45,  $p<0.01$ ,  $d=1.2$ ) demonstrated the most notable change, which was followed by the change in student-centered evaluation (mean change 0.29,  $p<0.01$ ,  $d=0.7$ ). Goal-orientation in mentoring, supporting students' learning processes and constructive feedback showed the third largest change (mean change 0.29,  $p<0.05$ ,  $d=0.5$ ).

## **DISCUSSION**

This study indicated that participation in mentoring education increases mentors' self-evaluation of mentoring competence. Other studies have also found that education improves mentors' confidence and ability to give feedback and evaluation to a student (Mitchell et al., 2018). Online mentoring education was shown to be effective in increasing confidence in assuming the mentor role (Larsen and Zahner, 2011). Russell et al. (2017) and Mårtenson et al. (2016) identified participation in mentoring education to positively affect participant views of clinical mentoring and working with students. The mentoring education provided in this study was evidence-based (Authors' names blinded) and developed carefully by involving mentor experts in the process. A systematic review of mentors' competence at mentoring nursing students during clinical practice (Authors' names blinded) was used as a theoretical framework for the intervention. The developed education included face-to-face teaching and online learning so that participants could study when it was best for them. On the other hand, during face-to-face teaching, participants discussed issues together to gain a deeper understanding of mentoring. Mentors' competence was assessed using the MCI, which has previously demonstrated acceptable content and construct validity along with sufficient internal consistency (Authors' names blinded).



Following mentoring education, participants reported high levels of competence at mentoring students in all areas except for student-centered evaluation. Nurses' scores for all areas of mentoring competence increased following the intervention, with mentoring practices in the workplace and student-centered evaluation demonstrating the most noticeable changes. The change in mentoring practices in the workplace could be explained by the fact that this area describes a practical issue that is easy to learn by participating in education. Student-centered evaluation has earlier been described as a difficult and complex process (Dobrowolska, et al. 2016; Helminen et al., 2015), while mentors have previously expressed evaluation to be challenging and time-consuming (Kalischuk et al., 2013; Helminen et al., 2016). Previous research has revealed that nurses feel as though they should be more knowledgeable about assessing student competence, while scholars believe each mentor should have adequate skills for mentoring and assessing student skills (Helminen et al., 2016). This study emphasized that mentoring education can increase registered nurses' competence in evaluating student during clinical practice, which is an important part of registered nurses' professional growth.

Registered nurses' competence at supporting students' learning processes increased after mentoring education. In earlier studies, mentors have ranked themselves as a student's most important source of support (McIntosh et al., 2014) and acknowledged that their main responsibility is supporting student learning in clinical practice (Ford et al., 2016; McIntosh et al., 2014). In this study, registered nurses' competence at goal-orientation in mentoring significantly increased after the completion of mentoring education. Previous studies have recognized that mentors play a significant role in guiding students through their personal goal-oriented learning processes and achieving the desired learning outcomes (Jokelainen et al., 2011). In this study, registered nurses' competence in identifying student needs also significantly increased following an educational intervention. Ford et al. (2016) earlier suggested that mentors have a pivotal role in guiding students' learning needs and facilitating learning opportunities during clinical practice.

Reflection during mentoring, mentor characteristics and mentor motivation were areas which did not significantly change after the mentoring education. The fact that nurses' baseline evaluations of reflection during mentoring, characteristics and motivation were already at a high level may explain why these areas of competence did not significantly increase. Similar results have been reported before, for example, mentors are generally motivated in mentoring students and understand that motivation is pivotal to effective mentoring (Gidman et al., 2011). Moreover, nurses understand that developing the student-mentor relationship can influence a student's sense of professional responsibility (Ford et al., 2016). The result that mentoring motivation did not significantly change may also be explained by the mentoring education being voluntary for all mentors in the organization,

which may have inherently drawn participants with higher motivation levels. Previous research has shown that mentors perceive their personal characteristics as the most important part of being an effective mentor (McIntosh et al., 2014).

The developed and evaluated mentoring education was proven to be effective at improving nurses' competence at mentoring students; for this reason, the same education is continuously being implemented with co-operation between university and hospital staff. The evidenced-based mentoring education can improve the competence of healthcare professionals (Nash and Flowers, 2017), which can, in turn, improve patient safety.

### **Limitations**

The presented research has certain limitations. Firstly, the participants self-reported their competence at mentoring, which may have led to greater measurement errors. Also, the participants knew that they were participating in the study, which may have affected their evaluations. It was not possible to use randomization, participant blinding or a control group in this study, and this issue will affect the internal validity of the study. The inclusion of a control group would have strengthened study validity (Des Jarlais et al., 2004) However, the described intervention was feasible, included an easy recruitment process and showed promising results about how education can increase mentors' competence in mentoring nursing students.

Secondly, the results may be affected by the participants having high mentoring motivation from the beginning. Out of the total number of participants, 24 participants (20%) had already previously completed mentoring education, which might have influenced the results. Only one percent of the participants had not yet experienced mentoring students in clinical practice.

Thirdly, the presented results should be generalized with caution since the findings represent mentors from three hospitals in Nordic Finland. The quasi-experimental study's methodological rigid was enhanced by using Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) scale as a guidance of the study (Des Jarlais, et al. 2004).

## **CONCLUSION**

This study aimed to evaluate how effective an education intervention would be at improving nurse mentors' competence at mentoring nursing student during clinical practice. We found that the intervention significantly improved registered nurses' competence at mentoring nursing students. The educational intervention was developed using a strong theoretical framework and the help of experts. The results of this study can be used to develop mentoring education that will serve as continuing

education for registered nurses and other healthcare professionals. More research is needed to evaluate mentoring competence in different context and assess various methods for providing mentoring education. Moreover, mentors who do not show motivation in mentoring students need to be encouraged to participate in mentoring education and receive support to develop their mentoring competence. We would also like to highlight that organizations should establish strategies which entail compulsory mentoring education before registered nurses can mentor students during clinical practice

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### **Conflict of interest**

The authors do not report any conflict of interest.

### **References**

- Cohen, J., 1992. A power primer. *Quant. Methods Psychol.* 112 (1), 155–159.
- Chen, I.J., Yang, K.F., Tang, F.I., Huang, C.H., Yu, S., 2008. Applying the technology acceptance model to explore public health nurses' intentions towards web-based learning: a cross-sectional questionnaire survey. *Int. J. Nurs. Stud.* 45, 869-878.
- World Medical Association, 2013. WMA Declaration of Helsinki - ethical principles for medical research involving human subjects. *JAMA* 310 (20), 2191-2194.
- Des Jarlais, D.C., Lyles, C., Crepaz, N., 2004. Improving the reporting quality of nonrandomized evaluations of behavioral and public health interventions: the TREND statement. *Am. J. Public Health* 94 (3), 361-366.
- Dobrowolska, B., McGonagle, I., Kane, R., Jackson, C., Kegl, B., Bergin, M., et al., 2016. Patterns of clinical mentorship in undergraduate nurse education: a comparative case analysis of eleven EU and non-EU countries. *Nurse Educ. Today* 36, 44-52.
- Glynn, D.M., Mcvey, C., Wendt, J., Russel, B., 2017. Dedicated educational nursing unit: clinical instructors role perceptions and learning needs. *J. Prof. Nurs.* 33 (2), 108-112.
- European Commission 2013/55/EU. Directive 201355/EU of the European Parliament and of the Council of 20 November 2013 amending Directive 2005/36/EC on the recognition of professional qualifications and Regulation (EU) No 1024/2012 on administrative cooperation through the Internal

Market Information System ('the IMI Regulation') [online]. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32013L0055&from=EN>

Ford, K., Courtney-Pratt, H., Marlow, A., Cooper, J., Williams, D., Mason, R., 2016. Quality clinical placements: the perspectives of undergraduate nursing students and their supervising nurses. *Nurse Educ. Today* 37, 97-102.

Gidman, J., McIntosh, A., Melling, K., Smith, D., 2011. Student perceptions of support in practice. *Nurse Educ. Prac.* 11 (6), 351-255.

Helminen, K., Coco, K., Johnson, M., Turunen, H., Tossavainen, K., 2016. Summative assessment of clinical practice of student nurses: a review of the literature. *Int. J. Nurs. Stud.* 53, 308–319.

Hilli, Y., Melenderc, H.L., Salmuc, M., Jonsénd, E., 2014. Being a preceptor—a Nordic qualitative study. *Nurse Educ. Today* 34 (12), 1420–1424.

Health Workforce Australia (HWA), 2013. National Clinical Supervision Competency Resource [online]. Available at: [https://www.clinedaus.org.au/files/resources/hwa\\_national\\_clinical\\_supervision\\_competency\\_resource\\_ve\\_201305\\_2.pdf](https://www.clinedaus.org.au/files/resources/hwa_national_clinical_supervision_competency_resource_ve_201305_2.pdf)

Victoria Department of Health & Human Services, 2015. The Resource Guide: Implementing the National Clinical Supervision Competency Resource and the Clinical Supervision Skills Review Tool [online]. Available at: <https://vicknowledgebank.net.au/wp-content/uploads/National-Clinical-Supervision-Competency-Resource-Guide.pdf>

Jokelainen, M., Turunen, H., Tossavainen, K., Jamookeah, D., Coco, K., 2011. A systematic review of mentoring nursing students in clinical placement. *J. Clin. Nurs.* 20 (19-20), 2854-2867.

Kalischuk, R., Vandenberg, H., Awosoga, O., 2013. Nursing preceptor speak out: an empirical study. *J. Prof. Nurs.* 29(1), 30-8.

Lakens, D., 2013. Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Front. Psychol.* 4, 863.

Larsen, R., Zahner, S., 2011. The impact of web-delivered education on preceptor role self-efficacy and knowledge in public health nurses. *Public Health Nurs.* 28 (4), 349-356.

McIntosh, A., Gidman, J., Smith, D., 2014. Mentors' perceptions and experiences of supporting student nurses in practice. *Int. J. Nurs. Prac.* 20 (4), 360–365.

Ministry of Social Affairs and Health (MSAH), 2004. Terveysalan työssäoppiminen ja ohjattu harjoittelu. Suositus sosiaali- ja terveydenhuollon toimintaympäristöille. Sosiaali- ja terveysministeriön monisteita 2003:22, Helsinki, Finland (in Finnish).

Mitchell, C., Ridgway, L., Sheeran, L., 2018. Preceptor education for specialty community-based nurses: a pre- and post-evaluation. *J. Contin. Educ. Nurs.* 49 (3), 111-118.

Mårtensson, G., Engström, M., Mamhidir, A.G., Kristofferzon, M.L., 2013. What are the structural conditions of importance to preceptors' performance? *Nurse Educ. Today* 33, 444–449.

Mårtensson, G., Lofmark, A., Mamhidir, A.G., Skytt, B., 2016. Preceptors' reflections on their educational role before and after a preceptor preparation course: a prospective qualitative study. *Nurse Educ. Pract.* 19, 1-6.

Nash, D., Flowers, M., 2017. Key elements to developing a preceptor program. *J. Contin. Educ. Nurs.* 48 (11), 508-511.

Nursing & Midwifery Council (NMC), 2018. Standards Framework for Nursing and Midwifery Education. Part 1 of Realising Professionalism: Standards for Education and Training [online]. Available at: <https://www.nmc.org.uk/globalassets/sitedocuments/education-standards/education-framework.pdf> (accessed 21.9.18).

Omansky, G., 2010. Staff nurses' experiences as preceptors and mentors: an integrative review. *J. Nurs. Manag.* 18 (6), 697-703.

Polit, D., Beck, C., 2011. *Nursing Research: Generating and Assessing Evidence for Nursing Practice*, ninth ed. Wolters Kluwer Health/Lippincott Williams & Wilkins, Philadelphia, PA.

Quattrin, R., Zanini, A., Bulfeno, G., Farneti, F., Panariti, M., Calligaris, L., et al., 2010. Italian nurse students' and clinical preceptors' perceptions about clinical practice experiences: questionnaire survey. *Ig. Sanita Pubbl.* 66, 695-703.

Russell, K., Allix, S., Gluyas, H., 2017. The influence of the art of clinical supervision program on nurses' knowledge and attitude about working with students. *J. Nurses Prof. Dev.* 33 (6), 307–315.

Senyk, J., Staffileno, B.A., 2017. Reframing nursing preceptor development: a comprehensive approach to improve education, standardize processes, and decrease costs. *J. Nurses Prof. Dev.* 33 (3), 131-137.

Walker, S., Dwyer, T., Moxham, L., Broadbent, M., Sander, T., 2012. Facilitator versus preceptor: which offers the best support to BN students? *Nurse Educ. Today* 33 (5), 530-535.

Windey, M., Lawrence, C., Gutrie, K., Weeks, D., Sullo, E., Chapa, D., 2015. A systematic review on interventions supporting preceptor development. *J. Nurses Prof. Dev.* 31 (6), 312–323.

Wu, X., Chan, Y., Tan, K., Wang, W., 2018. A systematic review of online learning programs for nurse preceptors. *Nurse Educ. Today* 60, 11-22.

**Table 1. The MCI instrument**

MCI 10-factor model	Number of items	Cronbach's Alpha
Student-centered evaluation	10	0.83
Goal-orientation in mentoring	9	0.79
Mentoring practices in the workplace	6	0.88
Reflection during mentoring	6	0.89
Mentor characteristics	7	0.87
Supporting students' learning processes	8	0.79
Mentor motivation	5	0.84
Identifying student needs	4	0.74
Constructive feedback	4	0.70
Mentoring practices between mentor and student	4	0.81

**Table 2. Content and learning methods within mentoring education**

Theme	Face-to-face learning	Online learning tasks
Acting as a mentor	The motivation of the mentor	Learning diary with task of mentor's role; individual SWOT analysis by mentors (Strengths, Weaknesses, Opportunities, Threats)
	Mentoring practices between mentor and student	
Mentoring process	Goal-oriented mentoring	Case studies related to goal-oriented mentoring, evaluation and feedback
	Student-centered evaluation	
	Providing feedback	
Diversity of mentoring	Mentoring practices in the workplace  Permissive learning environment	Learning diary with tasks of reflection on good clinical learning environment, one's own development process, education in mentoring and personal growth; individual SWOT analysis by mentors (Strengths, Weaknesses, Opportunities, Threats)



**Table 3. Participant distribution across educational interventions**

	Baseline ( <i>n</i> = 150)	Post ( <i>n</i> = 120)	Drop out ( <i>n</i> = 30)
<i>Time of participation</i>	<i>n</i>	<i>n</i>	<i>n</i>
Autumn 2013	30	23	7
Spring 2014	13	7	6
Autumn 2014	27	17	10
Spring 2015	16	16	0
Spring 2016	21	17	4
Autumn 2016	12	12	0
Spring 2017	17	16	1
Autumn 2017	14	12	2

**Table 4. Demographic characteristics of mentors**

		Baseline ( <i>n</i> = 150)	Pre-Post ( <i>n</i> = 120)	Drop out ( <i>n</i> = 30)	p-value
<i>Variables</i>		<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
Gender	Male	8 (5)	7 (6)	1 (3)	0.586*
	Female	142 (95)	113 (94)	29 (97)	
Age	≤ 29	33 (22)	26 (22)	7 (23)	0.960*
	30–49	99 (66)	78 (65)	20 (67)	
	≥ 50	18 (12)	13 (13)	3 (10)	
Work experience in health care (years)	< 11	80 (57)	62 (52)	15 (50)	0.583*
	11–20	43 (30)	42 (35)	9 (30)	
	> 20	27 (13)	16 (13)	6 (20)	
Workplace where students are mentored	Outpatient clinic	22 (15)	15 (13)	6 (20)	<b>0.001*</b>
	Inpatient unit	105 (70)	91 (75)	16 (53)	
	Surgery	23 (15)	14 (12)	8 (27)	
Discussion time with student	≤ 20 min	13 (9)	15 (13)	3 (10)	0.772*
	> 21 min	137 (91)	105 (87)	27 (90)	

Chi-squared test Pre-Post and Drop outs\*; significant p-value marked in bold