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Article

Self-efficacy impact of the Mini-CEX among nursing students in North Sumatera, Indonesia

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Abstract

Background: Mini-CEX is a popular workplace exam that includes direct observation and a feedback conversation. This evaluation occurs in a workplace setting as part of the daily work. Self-efficacy is a mandatory soft skill for nursing students during an internship. Therefore, this study aims to identify the effect of Mini-CEX on self-efficacy among these students.

Design and methods: A quasi-experiment design was conducted with a control group. All the nursing student intents of the Sari Mutiara Indonesia University were considered as the study population. This population was then divided into one control and one intervention group of 24 and 25 students, respectively. Subsequently, data collection was carried out using general self-efficacy.

Results: The results showed the self-efficacy was low in the control group (66.7%), and Mini-CEX was discovered to have a significant effect on self-efficacy among nursing students undergoing internships ($p=0.000$).

Conclusions: The Mini-CEX was concluded to effectively increase self-efficacy among nursing students and is suggested as a mandatory method for evaluating these students.

Introduction

Nursing practice nowadays, particularly in Indonesia, has a number of challenges, including the aging and more unwell section of the hospitalized patient population, the financial load of healthcare, and the need to keep up with medical knowledge and technological improvements.¹ These pressures are exacerbated by a growing nurse shortage and an aging nursing workforce. Nursing education has a substantial impact on nurses' knowledge and competencies, as well as the knowledge and competencies of all health care workers. Furthermore, nursing graduates are already in great demand, with senior nursing students being recruited as non-regulated caregivers.² Thus, nursing students undergoing internship are entering a highly stressed health system,

facing unprecedented challenges, and without appropriate preparation, supervision, as well as support, these novice practitioners are liable to place patients and other health care professionals at further risk.

Nurses with a Bachelor of Science in Nursing (BSN) degree are more equipped to address the requirements of a wide range of patients, serve as leaders, and develop science that benefits patients and health professionals' ability to provide safe, high-quality patient care.³ The competence of Indonesian nurses requires improvement, and one indicator of this competence, is the quality of the nursing care provided. According to No.38/2014, published by the Directorate General of Higher Education, Ministry of Research and Technology the competency test is the final stage of the nursing education process, and is supported by the quality of the nursing education.⁴

The October 2018 Indonesian Nurse Competency Test results of 302 newly graduated nurses, from five high school of nursing science in North Sumatera, showed over 50% (167) of the nurses, were incompetent and only 135 were competent.⁴ Most hospitals in Indonesia currently require a Nurse License Certificate, obtained on passing the national nursing competency test, prior to employment.⁴ Therefore, there is a need to improve the nursing program quality, for instance, through the development of evaluation methods and clinical guidance. Furthermore, nursing students are currently extremely limited in hospital clinical practice, and this is influenced by several internal factors, including nursing student motivation and low self-awareness.

Self-efficacy is the belief in one's ability to take actions, or organize and conduct the courses of action required to produce given results, in a bid to manage future situation.⁵ This is related to successful performance, and is able to improve the individual's motive as well as confidence to provide nursing care in complex situations. The self-efficacy theory was first proposed by Albert Bandura. Bandura and Zimmerman demonstrated students with higher self-efficacy tend to make maximal effort, be insistent, study hard and select difficult tasks, while confronted with a task, and view obstacles as opportunities rather than threats. Thus, the self-efficacy of student nurses ought to be evaluated.⁶

An increase in self-efficacy is able foster independence and

Significance for public health

Nowadays nursing requires a wide set of academic and commonsense abilities, and a successful nurse must coordinate these abilities in a wide extend of healthcare settings. Self-efficacy is the belief in one's ability to take actions or organize and conduct the courses of action required to produce given results, in a bid to manage future situation. This is related to successful performance and is able to improve the individual's motive as well as confidence to provide nursing care in complex situations. Mini-Cex is extremely helpful for preceptors applying knowledge as well as experience and increases self-confidence of becoming like role models.

confidence, while a strong sense of self-efficacy has been proven to enhance job satisfaction and the intention to remain in one's profession.⁷ In addition, Bandura reported students with low self-efficacy tend to avoid situations leading to previously occurring failure in the past.⁶ In nursing, this often leads to an educational catastrophe, and students tend to less clinical self-esteem and even leave the profession. This is partly responsible for the high attrition in nursing student population. Therefore, several strategies have been implemented to increase self-efficacy in nursing student, through the clinical guidance method.⁸

The clinical guidance methods applied to nursing students vary widely, with corresponding advantages and disadvantages. Currently, the methods often applied are direct observation of procedure skills (DOPS), objective structured clinical examination (OSCE), case reports, Side by side Teaching, case-based discussion, and mini clinical evaluation examination (Mini-Cex).^{7,9}

According to the World Health Organization (WHO), Mini-Cex provides opportunities for students to improve their skills for patients through various situations, as the students are directed and evaluated after direct observation has been carried out by supervisors.¹⁰ In addition, the WHO explained Mini-CEX fulfills 60% of the practical learning outcome requirements, and is highly feasible for preceptor students and students in health education.¹⁰ The trainee is assessed on his or her ability to take a history, do a physical examination, communicate effectively, use clinical judgment, professionalism, organization/efficiency, and provide overall clinical care during the Mini-CEX. Mini-CEX is an authentic assessment of performance and clinical competence because they allow for direct observation of trainees in their clinical setting. Direct monitoring of trainees' performance makes it easy to provide comments on observed behavior.^{8,9}

Mini-CEX is a highly effective formative assessment method for student self-efficacy, with several advantages, including validity and reliability, collection of feedback from preceptors, as well as provision of ample opportunities for the demonstration of student abilities in various cases, settings, and directly with patients.^{11,12} Furthermore, Mini-CEX is extremely helpful for preceptors applying knowledge as well as experience, and increases self-confidence of becoming like role models.⁷ However Mini-CEX has been frequently used in medical students professions and lack of evidence demonstrating effect on self-efficacy.¹² Whereas the Indonesian healthcare system is growing increasingly complex, and aspiring nurses will face a difficult healthcare practice environment. Due to known faults in the healthcare system, such as the Indonesian health care system, which is varied and unconstrained with insufficient funding, the 20th century has been defined by different health care system adjustments. The Mini-CEX in nursing education is need examine.

Therefore, this study aims to identify the effect of Mini-CEX on self-efficacy among nursing students in the Sari Mutiara Lubuk Pakam General Hospital.

Design and Methods

Design, setting, and population

This research was a quasi-experimental study without randomization because the subjects were divided into two groups. The intervention group were assessed using Mini-Cex, while the control was evaluated with the regular Observation Checklist assessment. In July to August 2020, the Mini-CEX will be included into our eight-week nursing internship, with Inpatient faculty rotating

in four-week blocks. Each of nursing interns (n=25) got a booklet containing ten customized Mini-CEX forms at their orientation. Our students were given nine assessments to collect: three from instructors (every two weeks), three from residents (every two weeks), and three from their outpatient attendings (one per week). In addition, the study population comprised only nursing student undergoing internship in the Sari Mutiara Lubuk Pakam Hospital. This research began in February, but was paused in March due to lockdown, and completed from July to August 2020. The inclusion criteria for this study were nursing student interns at the Sari Mutiara Lubuk Pakam Hospital, carrying out practical learning with 100% attendance, successful in the theory and practical examinations, and consenting to participate in the study. The total sampling technique was used, at that internship program consist of 25 students were in the intervention group, while 24 students were the control group.

This study has met the ethical considerations and was approved by the Ethics Committee of the Faculty of Medicine, North Sumatera Muhamadiyah University, Medan, Indonesia Number 406/KEPK/FKUMSU/2020 and was conducted after obtaining permission from the Director, Sari Mutiara Lubuk Pakam General Hospital.

Variables and data collection

The self-efficacy questionnaire used in this study consisted of 38 items with 4 Likert scales. The validity test demonstrated acceptable internal consistency and reliability was 0.78. This value indicated that the questionnaire used was valid and reliable. An interpretation of the score was ≥ 121 denoted higher self-efficacies while a score < 121 denoted lower self-efficacy.

Statistical analysis

Collected data were analyzed using SPSS ve. 22.0 (IBM Corp., Armonk, NY, US). Descriptive data are presented as frequency and percentage. Pre- and post-scores for self-efficacy compared by paired *t*-test.

Results

Table 1 shows an overview of the samples in this study. According to Table 1, the intervention group was comprised mostly of 22-year-olds (44%), while the control group comprised mostly 21 years old (62.5%). This was because the final year students had more opportunities to undergo Mini-CEX, during the study implementation. Meanwhile, in terms of gender distribution,

Table 1. The distribution frequency characteristics of nursing students in the control group and the intervention group (N=49).

Variable	Control Group (n=24)		Intervention Group (n=25)	
	N	%	N	%
Age				
20 years	5	20,8	5	20
21 years	15	62,5	9	36
22 years	4	16,7	11	44
Total	24	100	25	100
Gender				
Male	10	41,7	8	32
Female	14	58,3	17	68
Total	24	100	25	100

there were more females in the intervention (68%) and control (58.3%) groups. This is very common, as nursing education is most dominated by female students, compared to other social majors.

Based on Table 2, majority of the nursing students (88%) in the intervention group had high self-efficacy towards clinical skills, compared to the control group, where most student nurses (66.7%) exhibited low self-efficacy.

According to Table 3, the mean self-efficacy increased significantly after the Mini-CEX intervention, compared to before the intervention, with a mean difference of 9.76. The Paired *t*-test statistical analysis obtained p -value=0.000 ($p < 0.05$) in the intervention group. The Mini-CEX intervention was therefore concluded to have a significant effect on increasing self-efficacy.

Discussion

The results showed that most nursing students (88%) had high self-efficacy towards clinical skills. A study by Zhao *et al.*, discovered high or positive self-efficacy helps to increase optimistic attitudes in students, for implementing problem-solving strategies, while providing nursing care.⁷ This is reinforced by definition of self-efficacy according to the concept of Bandura,⁸ stating self-efficacy is a person's self-belief in the ability to take action according to the expected goals. Furthermore, a study by Miller *et al.*¹² used writing media ascertain the self-efficacy of nursing students, and discovered regular documentation of nursing student abilities, is useful in providing opportunities for practice of desired skills.

Meanwhile, research by Abdal *et al.* on the use of Nursing Clinical Self-Efficacy Scale (NCSES) in measuring the self-efficacy of nursing students, obtained a mean value of 219.28, and this was categorized as moderate self-efficacy.¹³ In addition, numerous factors were discovered to influence student efficacy, including environment, practicing nurses, and educators or mentors of nursing students. This is in line with the study by Cupak *et al.*, reporting the sense of self-efficacy of nursing students has a significant effect on stress levels and coping mechanisms during clinical practice, with the results of the study showing increased self-efficacy leads to increased self-confidence in the future achievements.¹⁴

According to the results, a significant difference in self-efficacy occurred after the Mini-CEX was carried out on nursing students, compared to before the evaluation, with a p value of 0.000 ($p < 0.05$). Similarly, a study by Amila *et al.* on the competence of neurological examinations performed by nursing students reported a significant difference ($p = 0.000$) in the clinical nursing practice of students evaluated using the Mini-CEX methods.¹⁵ This confirms the Mini-CEX is a suitable evaluation method, as the approach provides students with the opportunities for students to improve nursing abilities. In addition, students receive directions from supervisors, at the end of the evaluation.

Similar with study by Jasemi *et al.* discovered the use of Mini-CEX is an effective method of evaluating the clinical skills possessed nursing students because of the ability to improve student learning abilities, and Enthusiasm in learning increases the quality of skills produced.¹⁶ Similarly, a research by Liu *et al.* showed the Mini-CEX is also suitable for evaluating the competence of nursing

students at the postgraduate level, and this is in accordance with the results of the study showing the Mini-CEX method was effectively used as an option for evaluating the competence of nursing students.¹⁷ A pilot study conducted by Martina and Simanjuntak showed the self-efficacy among midwifery student was increasingly by implementation of Mini-CEX.¹⁸

The Mini-CEX was proposed by the American Board of Inside Medication in 1972 to address shortfalls in conventional clinical assessments for inhabitants. This modern abbreviated assessment arrange surveys a resident's clinical judgment and understanding counselling aptitudes based on their capacity to require a persistent history and perform a physical exam. This Mini-CEX for restorative understudies and inhabitants reflects going to physicians' desires for educating rounds, and deliberately centers on the aptitudes required in an real persistent experience. As characterized by Virginia Henderson, "The unique function of the nurse is to assist the individual, sick or well, in the performance of those activities contributing to health or its recovery (or to a peaceful death) that he would perform unaided if he had the necessary strength, will or knowledge. And to do this in such a way as to help him gain independence as rapidly as possible."¹⁹ Although physicians and nurses share common ground on persistent care, numerous of the specified competencies, states of mind, and responsibility particularly in connection to the caring part of nurses. Therefore, improving of self-efficacy among the nursing students is mandatory learning outcome of internship program. Due to developing awareness encompassing issues of nurse competence, increasing a clinical examination has become significantly important for educators and preceptors. It is essential for the support of fresh graduate nurse's standard. The utilization of Mini-CEX in this study was effective to improve self-efficacy of the nursing students.

Future directions

Future research is recommended to explore the experiences of implementation of Mini-CEX among internship nursing students by applying the qualitative design and the develop the tools of impact Mini-CEX. Furthermore, the Mini-CEX could be the recommended evaluation method during internship in nursing.

Conclusions

Based on these findings, Mini-CEX ought to be emphasized in the nursing education system, to improve self-efficacy in nursing students. Nursing students are faced with numerous challenges and pressures, therefore, the education system ought to be encouraged to support nursing student undergoing internship, in a bid to improve self-efficacy. This study also serves as a reference for

Table 2. The distribution frequency of self-efficacy among intervention and control group (N=49).

Self-efficacy	Intervention		Control	
	F (25)	%	F (24)	%
Low self-efficacy	3	12	16	66,7
High self-efficacy	22	88	8	33,3

Table 3. The differences in self efficacy among nursing students evaluated using the Mini-Cex method.

Variable	Intervention	Mean \pm Std. Deviation	Mean diff.	<i>t</i>	<i>P</i> value
Self-Efficacy	Pre-intervention	111.76 \pm 5.27	-9,76	-7,64	0.000

studies aimed at improving the nursing education system. However, this study is limited by the short time of data collection, due to the COVID-19 pandemic and preventive protocols.

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Key words: Mini-cex, Nursing students, Self-efficacy.

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Availability of data and materials: The data utilized to support the findings of this study are available from the corresponding author on reasonable request

Ethical approval: This study was approved by Ethic Review Board (ERB), for Human Subject Study, Faculty of Medicine, North Sumatera Muhammadiyah University, Medan, Indonesia with Number 406/KEPK/FKUMSU/2020.

Patient consent for publication: Prior to the study, all patients had signed an informed consent, which explained that the results of this study could be used in the form of reports, presentations, and publications, but the researcher would not identify the patient's personal data.

Informed consent: An informed consent was obtained from each subject after they were provided with complete descriptions of the aims and procedures of the study, were made aware of data protection, and were ensured they could terminate the study at any time.

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