The effect of communication skills training on the self-efficacy of nurses: a systematic review and meta-analysis study

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ABSTRACT

Background: Self-efficacy is one of the determinants of effective communication between the nurse and the patient, and promotion of communication skills can increase it.

Aim: This systematic and meta-analysis study aims to investigate the effectiveness of communication skills training on the self-efficacy of nurses.

Methods: PubMed, Science Direct, CNHAI and Web of science were searched up to 2017, for relevant studies. Studies that assessed the effect of communication skills training on the self-efficacy of nursing personnel were included in the study. Finally, 10 studies were selected. In this study, novice and nursing students were not considered. The standard deviation (SD) mean of changes in communication self-efficacy was used to assess Hedges’ g to be used as a size effect for meta-analysis. DerSimonian and Liard random effects model was included in the study in order to summarize the effects.

Results: Meta-analysis findings showed that communication skills training could improve nurses’ self-efficacy (Hedge’s g = 0.51, 95% CI: 0.311-0.699, p<0.001). Education was also affected by increasing the self-efficacy based on the random-effects model. Its effect retained significant in single group trials. The effectiveness of communication skills training was higher in studies with the intervention group compared with control groups. The quality of studies was investigated based on Cochran. Most studies were qualitatively low.

Conclusion: Educational programs for nurses’ communication improve their feelings towards self-efficacy communication. Due to the importance of self-efficacy in communication skills development, training related communication skills should be considered as a permanent program in hospitals.

INTRODUCTION

The communication between nurses and patients is one of the basic principles in nursing care and is of the important strategies for improving the quality of care. Communication level between nurses and patients is one of the primary patient’s experience. Several studies have identified communication as a pre-requisite factor for revealing patient symptoms, concerns, and issues, and thereby a vital skill to obey of the treatment, diagnostic, health promotion, and rehabilitation programs.

Given that good communication in care is of great importance, significant issues such as lack of information, inappropriate information and lack of accountability are still reported in patient satisfaction surveys. One of the most critical issues in improving the relationship with the patient is when nurses feel that their communication is effective, which Bandura defines as self-efficacy. Self-efficacy is defined by believing in the ability of a particular task and is a key concept in explaining health intention and behavior. This issue influences all aspects of nurses’ performance, including the ability to think optimistically, be patient with problems, and ultimately complete tasks correctly. People with low self-efficacy have pessimistic thoughts about their abilities; therefore, they are avoided in any situation that, according to them, exceeds their abilities. In contrast, individuals with high self-efficacy consider hard tasks as challenges that can dominate them. They choose challenging tasks, their self-efficacy will be improved faster, and their efforts will be sustained if problems are encountered.

Previous research studies have shown that communication training may improve communication self-efficacy. Higher communication self-efficacy was found to be the result of communication skills training which can lead to improved communication performance.

Therefore, training courses should be conducted on the trustworthiness and ability of nurses and doctors in providing care and in these training courses, introspection and self-awareness should be considered as the behavior promotion. Given that at least half of nursing education courses is done in clinical environments, clinical education has a basic role in creating professional skills in nursing
students. In recent years, communication skills training has been the main component of nursing education curriculums in advanced countries and is recognized as one of the continuing nursing education.\textsuperscript{14} The training of communication skills that has been done includes combined training including simulation, scenario, role-playing, and feedback and group discussion that has been done in many studies.\textsuperscript{6,10,14-20} However, considering related studies that have been done, there has been no systematic work on the effectiveness of communication skills training on the nursing staff’s self-efficacy. The current meta-analysis plays an important role by providing overall estimates of the effect of communication skill training on nurses’ self-efficacy. The authors conducted this meta-analysis based on Prospero quality standards (CRD42017073927) for reporting. It was sought to answer the question, “Does the communication skill training affect nursing self-efficacy?”

**METHODS**

PubMed®, CINAHL®, Web of science and Science Direct\textsuperscript{*} were used in many intervention studies; furthermore, some technical terms including education, nursing communication skills training, self-efficacy, self-concept, confidence, nursing education research, communication skills training, and nursing personnel were utilized. Self-efficacy, self-confidence, and self-concept are used in nursing contexts interchangeably. Although these concepts are related, they have different attributes. Since self-concept and confidence represent personal features that have a stable influence on behavior, whereas self-efficacy shows a temporary characteristic associated with a specific situation.\textsuperscript{21} Therefore, reference lists were searched to find more studies about communication skill training and nurse self-efficacy. It was found that a researcher used a double-entry verification process for extraction to ensure consistency. Randomized control trial, experimental and non-experimental designs were included in some research studies. Inclusion criteria were nurses, communication skill training including simulation, role play, scenario-based and whatever had been about promoting communication interventions, and self-efficacy outcomes. Thus nurse students and novices were excluded from the study. The studies included in this systematic review are summarized in Table 1.

**Statistical Analysis**

Mean differences of self-efficacy and standard deviation in single group studies and control group studies were investigated using Hedges’g in order to measure the effects of meta-analysis. Cohen has classified the effect size in to small, moderate and large (0.49 = small, 0.5 to 0.8 = moderate, 0.81 = large) which shows the result of effect size study.\textsuperscript{27} The authors performed random-effects meta-analysis to investigate pooled effectiveness estimates. Both within-study variance and between-study heterogeneity were taken into account in the investigation.\textsuperscript{28} The studies were evaluated by the inversion of within-study variance along with the between-study heterogeneity provided by the DerSimonian and Laird (1986) method. The weight depends on the accuracy and size of the studies in the calculation of the overall estimate. The current research study reports both estimates and 95% confidence intervals (CI).

For each analysis, the authors also measured the heterogeneity and performed bias tests. Regarding heterogeneity, the total dispersion in effect sizes (Q) and the related p-value was calculated. The I² was used to evaluate the variation observed in effectiveness estimates in the studies; I² varies from 0% (indicating that all of the heterogeneity is “false”) to 100% (indicating that all of the heterogeneity is “real” and requires further examination and explanation). In general, I² values over 50% represent extreme heterogeneity.\textsuperscript{29}

Furthermore, formal significance testing was used to determine whether the heterogeneity was significantly far from zero. The study bias was also assessed graphically by Egger’s test.\textsuperscript{30} Furthermore, Duval’s and Tweedie’s trim and fill-in cases of asymmetry were used.\textsuperscript{31} The predetermined subgroup analysis revealed the excessive heterogeneity sources. The comprehensive Meta-Analysis software did the analysis.

**Quality assessment**

The Cochrane Collaboration was used to assess the bias risk. Features of interest in a standard ‘Bias risk’ table were; sequence generation (selection bias), allocation sequence concealment (selection bias), participants and personnel’s blinding (performance bias), outcome assessment blinding (detection bias), incomplete outcome data (attrition bias), selective outcome reporting (reporting bias) and other possible sources of bias.\textsuperscript{32} These domains were classified as yes (low bias risk), no (high bias risk) or unclear.

**RESULT**

Studies published between 1997 and 2017 investigated personnel nurses’ self-efficacy after communication skills training, where communication skills training was in the context of nursing care for adult
### Table 1: Observational prospective studies eligible to include in the systematic review and meta-analysis

| Author          | Title                                                                 | Country | Design  | Sample | Intervention | Main result (self-efficacy)                                                                 |
|-----------------|------------------------------------------------------------------------|---------|---------|--------|--------------|----------------------------------------------------------------------------------------------|
| Ammentorp (2007)
| The effect of training in communication skills on medical doctors’ and nurses’ self-efficacy | Denmark | RCT     | 43     | Lecture and recording video for feedback | Mean difference after six months: 1.51 p<0.01                                                  |
| Doyle (2009)
| A course for nurses to handle difficult communication situations. A randomized controlled trial of impact on self-efficacy and performance | USA     | RCT     | 33     | Lecture, scenarios and role play | F = 25.4, p<0.001 Ancova test                                                                 |
| Ammentorp (2009)
| Coach training can improve the self-efficacy of neonatal nurses. A pilot study | Denmark | One single study | 20 | Lecture, Roleplay, feedback | The self-efficacy scores increased up to 14.8% In Neonatal nurses                                |
| Nørgaard (2012)
| Communication Skills Training Increases Self-Efficacy of Health Care Professionals | Denmark | One Single study | 88 | videotaped scenarios, role-plays, and simulated communication | Mean difference after 6 month =1.04 P=0.001                                                   |
| Khodadai (2013)
| The Effect of Communication Skills Training on Quality of Care, Self-Efficacy, Job Satisfaction and Communication Skills Rate of Nurses in Hospitals of Tabriz, Iran | Iran    | experimental study | 31 Control study | Lecture and Pamphlet | Experimental Before=56.90(5.35), after=56.73(6.61), CI=-2.13 - 2.47, t = 0.146 df = 41 P=0.885 Control group:before=55.74(4.41) CI=-1.41-2.63 t = 0.618 df = 30 P=0.541 After:55.12(3.91) |
| Raica (2009)
| Effect of Action-Oriented Communication Training on Nurses’ Communication Self-Efficacy | USA     | One single study | 25 | Action-oriented | Pre-test 71.96, post-test 77.32,T=.3.03 df =24 p=0.006                                         |
| Parle (1997)
| A development of a training model to improve health professional skills, self-efficacy, and outcome expectancies when communication with cancer patients | England | One single study | 19 | Video demonstration and Role play | Self-efficacy increased, but nurses not different.                                            |
and pediatric patients, were identified. In total, 21132 articles were found in the initial searching (PubMed=9254, since direct=1000, Cinahl=10878). After the elimination of duplicates, 11174 articles remained. Through reading the title and abstract, 150 articles were excluded. By reading the full text of articles, 20 articles were excluded and 12 articles remained. Finally, 12 observational studies, including 3 Randomized Control Trial (RCT) studies, 15,19,22 2 experimental studies 20,25 and 7 pretest and posttest designs 16-18,23,24,26,29 were considered for inclusion in the systematic review, and 10 studies (out of 16 papers included unsystematic review) including 2 RCT studies, 15,19 2 experimental studies 20,25 and 6 pretest and posttest designs 16,18,23,24,26,33 were included in the meta-analysis (Figure 1).

The studies included in this systematic review are summarized in Table 1. The following studies were introduced into the meta-analysis, such as 2 studies related to the effect of the self-conscious program 16,33 Secondly, 2 reviews with the impact of the curriculum on the way of communicating in difficult situations 18,20,32 Third, 3 studies of a communication skills training program on self-efficacy of nurses 15,29,31 Then, a review of the effect of a coach training program for nurses in the neonatal department 30 At least, a comparative study of a scenario-based simulation training
program using a non-simulation educational program, its impact on the self-efficacy scale. In the survey of Khodadadi et al., the communication skill training was conducted in lectures and pamphlets. This intervention did not significantly increase the self-efficacy of nurses about patients. In the study of Parle et al., and Ammentrop et al., the study group includes physicians and nurses. The results of these two groups were not separated; therefore, they were not entered into the meta-analysis.

**Assessment of Bias Risk**

Two studies entered in the systematic review had good qualities based on aspects selected for the quality assessment, and two studies were classified as fair. Nine studies did not report any method used to conceal the participants' allocation, and eight studies did not mention incomplete outcome data. Regarding analysts' blinding, one of the studies tried to address this source of bias. No particular outcome evidence was found in the included studies (Table 2).

| The first author (year) | Random sequence generation | Allocation concealment | Blinding of outcome assessment | Incomplete outcome data | Selective reporting | Score | Overall quality |
|-------------------------|---------------------------|------------------------|-------------------------------|------------------------|---------------------|-------|-----------------|
| Doyle (2009) 15          | ?                        | +                     | +                            | +                     | +                   | 3     | Good            |
| Ammentorp (2009) 25      | -                        | -                     | ?                            | ?                     | ?                   | 0     | weak            |
| Nørgaard (2012) 24       | -                        | -                     | ?                            | ?                     | ?                   | 0     | weak            |
| Khodadai (2013) 25       | +                        | ?                     | ?                            | ?                     | ?                   | 1     | fair            |
| Raica (2009) 16          | -                        | -                     | ?                            | ?                     | ?                   | 0     | weak            |
| Banjere (2017) 14        | -                        | -                     | ?                            | ?                     | ?                   | 0     | weak            |
| HSU (2014) 19            | +                        | +                     | +                            | +                     | +                   | 3     | Good            |
| Liu (2007) 20            | +                        | ?                     | ?                            | ?                     | ?                   | 1     | fair            |
| Pehrson (2016) 24        | -                        | -                     | ?                            | ?                     | ?                   | 0     | weak            |
Results of Meta-analysis

Ten studies reported self-efficacy outcomes. A Likert-type scale was used in 6 studies. A 10 point scale was used in 2 studies. A 100 point scale was used in 2 studies. The meta-analysis results from 10 studies are revealed in Figure 2. The results suggest that the effect of communication skills training increases self-efficacy. The effect of communication skills training was moderate (Hedges'g = 0.51, 95% CI: 0.31 to 0.70 p < 0.001) (Figure 2). Among the studies, there was evidence of heterogeneity (Cochrane Q test, Q statistic = 45.4, p = 0.017, I^2 = 63.74), and in studies with control group (Cochrane Q test, Q statistic = 15.94, p < 0.001, I^2 = 81.18) heterogeneity has been seen.

Sensitivity Analysis and Publication Bias

Analyzing Sensitivity Levels and Publication Bias

A sensitivity analysis could not show any significant change regarding the effect of communication skill training on self-efficacy after removing the studies from meta-analysis. Publication bias was found in the meta-analysis examining the impact of communication skill training on self-efficacy scale by Begg's (p = 0.025) and Egger's asymmetry tests (p = 0.003). Duval's and Tweedie's trim and fill test also indicated that even with the addition of four studies, the bias existed between studies (Figure 4).

DISCUSSION

The results of the random-effects meta-analysis, which was performed on 10 studies, showed the effect of communication skills training on nurses’ self-efficacy improvement. When nurses believe that they can communicate with the patient, there will be better communication with the patient. In the study of Prussia et al., it was concluded that self-efficacy directly affects the individual performance. It also plays a mediating role in how to manage and lead individual behaviors and performance. The nurse does not tend to communicate with the hard situations, such as anger. Nurses with less self-efficacy are more vulnerable to stress and labor pressure; therefore, they perceive that work and care are difficult and this perception leads to a decrease in the performance of a person. Bandura has argued that educating and expressing the experiences of successful individuals can improve the understanding of communication; furthermore, training with communication scenarios, role-playing and handling stressful situations can reduce stress and improve self-efficacy. In reviewing the studies, researchers have used a variety of educational methods to improve communication skills and self-efficacy. Moreover, communication skills training did not increase self-efficacy in nurses. The lack of intervention in this study could be due to training methods. Lecture and pamphlet training were utilized in order to promote communication
skills level. While in other studies, for communication skill training, several methods such as group discussion, role-play, and training with film and lecture were utilized.\textsuperscript{16,17,19,31,32} The use of hybrid methods in this study showed that it could increase nurses’ self-efficacy. Meta-analysis results showed that the interventions used by the control group to compare the effect had a greater impact on self-efficacy. In general, studies using the control group for comparison are scientifically better. Although review studies have examined the effect of communication skills training on nursing students and nurses, the specific effect of communication skills training on improving the communication skills of nurses has not been analyzed.\textsuperscript{36,37} For instance, in a communication skills training study, no significant difference was found between students’ self-efficacy.\textsuperscript{38} Furthermore, investigation of review studies results showed that lack of communication skills training had affected the improvement of self-efficacy, which could reduce the inconsistency in the results.\textsuperscript{37,39}

In the study of Franklin and Lee,\textsuperscript{40} the effect of simulation training on self-efficacy improvement was conducted in nursing students. The results showed that practice based on simulation could increase self-efficacy. This study was based on simulation training, while in the present study, the effect of communication skills training on nurses was studied.

**Heterogeneity between Studies**
Analysis of control conditions can help to achieve real results. In 6 pretest-posttests the only method of assessment was the effect of communication skills training on self-efficacy. In 2 studies, a non-randomized control group was used. Only two randomized controlled trials (RCTs) were used. Multiple study methods can lead to heterogeneity of studies. Increasing self-efficacy would be possible in communication skills training without using a control group. The number of people in groups was also different, which could lead to heterogeneity. In one study, self-efficacy increased in both control and intervention groups.\textsuperscript{19} In the control group communication skills were also trained; however, the method of training was different from the intervention group.

Diversity in interventions can lead to heterogeneity among studies. In some interventions, feedback, role-playing, and lecturing were used in promoting communication skills. As against in some of other interventions, lectures and feedback as well as a number of them, self-awareness was used. These different methods can lead to heterogeneity of studies. Another potential reason is self-assessment of the ability of nurses before the intervention, which can affect the actual increase in self-efficacy.\textsuperscript{41}

Using various methods of self-efficacy evaluation can also lead to heterogeneity. In some studies, the Likert scale was used, as well as in some studies, ten scores or 100 scores scales used. Difference self-assessment estimation can affect the heterogeneity of studies, and one of the problems of behavioral interventions is the use of various evaluation methods. Only Cronbach’s alpha was used for psychometric assessment of the questionnaire of studies. Other techniques, such as factor analysis, were not used to determine the reliability of studies that could affect the heterogeneity of studies.

**Strengths and Limitations**
This study aimed to analyze the effect of communication skills on the self-efficacy of nursing personnel which previous studies had not reviewed this scale. This study specifically evaluated the impact of communication skills training on nurses’ self-efficacy. The results of this study strongly demonstrated that the use of several

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**Figure 3** Forest plot showed overall effect of communication skill training on self-efficacy as well as subgroup analysis based on study design

**Figure 4** Funnel plot of Standard Error by Hedge’s g
educational methods could lead to increased self-efficacy and using one approach cannot have a significant effect. One of the weak points of this study is to combine the use of multiple interventions that their comparison can lead to heterogeneity of results. Different methods also measured the self-efficacy scale.

CONCLUSION
The combination of communication skills training can increase the communication efficacy of nursing personnel. This result could be a way for researchers to apply the communication skills training systematically.

CONFLICTS OF INTEREST
Authors state that there are no conflicts of interest.

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