Comparison of Endotracheal Intubation Training on Mannequins and Normal Patients in Anesthesia Students

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ABSTRACT

Medical disciplines need to be aware of the vital and life-saving measures of individuals and patients; Therefore, all of them must be properly trained in CPR and master it. The aim of this study was to compare endotracheal intubation training on mannequins and normal patients in anesthesia students. This descriptive study was conducted in 2018 with the participation of 40 sixth semester students of anesthesiology. Before the test, all of them took theory courses, and then they took practice courses and were tested; One group performed on the mannequin and the other group performed on the patient. Finally, the results were compared between the two groups. The pre-test scores in group A were 08.15 ± 05.2 and in group B were 51.14 ±38.1, which did not show a statistically significant difference between the two groups. (P=0.325) Post-test scores were 89.17 ±08.0 in group A and 51.1 ±01.21 in group B, which showed a significant difference between the two groups (P = 0.012). Intubation training on mannequins scored higher than the normal patient, and the researchers of the present study conclude that before intubation and any practical skills, students have passed the theory units well and then learned the skills. Practice on mannequins and finally improve their skills on patients, and before any practical action on the patient, it is necessary to perform practical skills on mannequins.

Keywords: Intubation, Training, Skills, CPR
Introduction

Cardiopulmonary resuscitation is the most important general skill and is a quick and immediate intervention to prevent the death of a person with cardiopulmonary arrest (1). The main goal of cardiopulmonary resuscitation of patients is to return to life and also to return the main and vital organs of the body (2). Resuscitation consists of two parts: basic vital support and advanced cardiopulmonary resuscitation. The first and most important step in basic vital support is opening the airway and establishing ventilation (3). Opening the airway and establishing ventilation by endotracheal intubation is the best method and is a necessary and primary step in resuscitation (4) and if done quickly and correctly, the failure rate of resuscitation operations up to approx. Greatly reduces and in turn increases survival (5, 6); Therefore, the endotracheal intubation stage should be considered as the most important step in resuscitation. Successful resuscitation requires three components of medical knowledge, basic and efficient training, and proper implementation, which indicates the importance of training in rescuing the patient (7) and if the training is not done in one of the resuscitation stages or is done incompletely, It can make the whole resuscitation operation fail (8). One of the stages of resuscitation training is endotracheal intubation training, which is very effective as an initial and important step in the success of resuscitation (9). Every training leads to learning, but how sustainable and deep the learning will be depends on the teaching method (10); Therefore, the current need to increase the quality of intubation training is one of the important steps of resuscitation (11) and if the quality of training is not desirable, it can cause resuscitation failure, brain complications in the client and its death (12). Therefore, in order to improve the quality of education, the right methods should be used (13). One of the educational methods used in medical science groups is the use of mannequins in clinical skills class; In this way, students perform the required skills on mannequins that are very similar to ordinary people before they go to bed with the patient (11); According to studies, the use of mannequins, which is a kind of simulation training, can increase practical skills and self-confidence (14), increase knowledge and self-efficacy (15) and critical thinking (16). However, since the mannequins are not completely similar to the normal person, the training performed by them is different from the normal mode and when the person is placed on the patient's bed (17) in such a way that the person When working with a mannequin, he does not understand the stress of work (11), the fear of failure in the skill performed (18), and the adverse outcomes he experiences when working with the
average person (19). Another educational method is to perform practical skills on patients; In this method, the person has already received the necessary information in the field of performing the required procedure and is now doing it practically on his patient (20); Using this method, in addition to increasing practical skills (7), consolidating learning and trying to do the skills correctly (21), can increase stress (22), frustration and harm to the patient (23). Considering that having sufficient and principled skills in anesthesia students is necessary and not providing an educational method that fully guarantees the practical training of students and promotes their practical skills, as well as inconsistencies in the results of face studies In the field of training on mannequins and normal patients, the researchers decided to conduct clinical trial studies with the aim of comparing endotracheal intubation training on mannequins and normal patients.

Methods

The present study was a descriptive study. Forty sixth semester anesthesia students after announcing the call for study plan and registration to participate in the present study and completing the informed consent form, observing the criteria of entry (passing CPR theoretical units) and exit (physical and mental illness, previous history of intubation), They were randomly divided into two groups A and B based on randomization software. The research environment in the present study included the paramedical faculty of Tabriz University of Medical Sciences and the general operating room of Imam Reza Hospital. In the first stage (theoretical stage), all students (both groups) participated in the intubation training class in theory for three hours. It should be noted that the class was administered in the form of a lecture and the use of a video projector. Also, the necessary equipment (laryngoscope, endotracheal tube, etc.) was available for students to get acquainted and practice. At the end of the theory course, the level of knowledge and awareness of students in the field of intubation was measured by a researcher-made questionnaire; This questionnaire had 25 questions in the field of endotracheal intubation that measured the level of knowledge and knowledge of students. Each question had a minimum score of one and a maximum of four points. The score range from the questionnaire was from 25 to 100, with scores ranging from 25 to 50. The giver of poor knowledge and awareness was 50 to 75 average knowledge and awareness and 75 to one hundred good knowledge and awareness. After that, each group was placed in its own research environment and in the presence of the supervising professor (anesthesiologist), intubation was performed inside the trachea and each person's score was
measured by a direct observation checklist of practical DOPS skills; This checklist had a score range from zero to twenty, with higher scores indicating higher student skills. In the second stage, group A in the Skills Laboratory Unit (SKILL LAB) of the faculty and group B in the operating room of Imam Reza Hospital by an experienced anesthesiologist in the field of intubation training (full time professor of anesthesia in the medical school) for three hours. Received the necessary items for intubation in practice. At this stage, none of the students were allowed to do any practical work. In the third stage (practical stage), group A performed intubation intubation on the mannequin in the SKILL LAB unit of the faculty, and group B, with the necessary coordination, went to the operating room of Imam Reza Hospital and supervised Anesthesiologists performed intubation intubation. In this regard, after obtaining full permission and consent of patients before intubation, intubation was performed on patients aged 20 to 60 years with ASA I-II with malapathy I and II to the relevant study in terms of Do not damage the credit. It should be noted that for each student, the DOPS checklist was completed by the supervisor. The questionnaire used for content validity was reviewed by ten faculty members. After receiving suggestions and comments, the necessary corrections were applied; It should be noted that there was no change in the content of the scale. Also, the reliability of internal consistency of Cronbach's assessment scale and alpha was equal to 0.80. After data collection, descriptive statistical tests and Mann Whitney U statistical test were used to compare the two groups. Data analysis was performed using SPSS software version 22. In this study, P <0.05 was considered significant.

Results

The mean age of participants in group A was 56.21 ±13.1 and group B was 7.1 ± 05.21; According to the results of Mann Whitney U test, no significant difference was observed between the two groups in terms of age. (P <0.05) The level of knowledge and awareness of all students participating in the study (both groups A and B) was "good" (Table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group B</th>
<th>Group A</th>
<th>P value</th>
</tr>
</thead>
</table>

Table 1: Age and level of knowledge of the two groups participating in the study
The pre-test scores in group A were 08.15 ± 05.2 and in group B were 51.14 ± 38.1, which did not show a statistically significant difference between the two groups. (P = 0.325) Post-test scores were 89.17 ± 08.0 in group A and 51.1 ± 01.2 in group B, which showed a significant difference between the two groups (P = 0.012). (Table 2)

**Table 2: Pre-test and post-test scores of the two groups participating in the study**

<table>
<thead>
<tr>
<th>Time</th>
<th>Group B</th>
<th>Group A</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>14.51 ±1.38</td>
<td>15.08 ±2.05</td>
<td>0.305</td>
</tr>
<tr>
<td>post-test</td>
<td>16.01 ±2.51</td>
<td>17.89 ±0.08</td>
<td>0.012</td>
</tr>
</tbody>
</table>

**Discussion**

The aim of this study was to compare endotracheal intubation training on mannequins and normal patients in medical students of Tabriz University of Medical Sciences. Based on the interpretation of the results, it was found that the mean standard deviation of the age of students participating in the study is 21 ± 1.3 that no statistically significant difference was observed between the two groups; The results of the present study are in line with the results of studies conducted in this field (18, 28, 29); In this regard, Goodman et al. Believe that the lack of a statistically significant difference between the age of students in a class (classmate) is quite natural that the results of his study are consistent with the present study, on the other hand, Alan et al. The age view is evident among medical students and the results of his study are not in line with the present study in this dimension (22). Evaluation after presenting content theory is one of the common evaluation methods that this type of evaluation has been used in this study. In the present study, after analyzing the statistical results, it was found that all students participating in the study from the level of "Well" in terms of knowledge and awareness of intubation. In this regard, Kennedy states in his review study that most medical students do not have a suitable level in the field of educational units. Also, in another part of his article, he states that medical professors believe that theoretical teachings are based on Medical students' awareness is not as effective as it should be; The results of his study are not in line with the results of the present study and are
contradictory (30). On the other hand, Limbach et al. The present study is not consistent (31). It should be noted that in the present study, with a very short interval (ten days) after the theoretical training, practical training was started and the evaluation was done before the practical training. On the other hand, Zaidi and Nasir believe that if theoretical teachings are based on scientific principles, acceptable results should definitely be expected that the results of their study are in line with the results of the present study (32).

In the present study, there was no statistically significant difference between groups A and B in the pre-test. In fact, the students participating in the present study did not differ significantly in terms of intubation before the intervention; Routstein et al. The deceased were used for intubation training, which may be effective in the end result. What was different in the present study from theirs was the use of the patient alive and normal; The results of their study are consistent with the results of the present study (11). Hawiz also believes that there is no statistically significant difference between the group that performs intubation on the mannequin and the group that performs it on the normal patient, and each method in turn has advantages and disadvantages in training that in general do not make a difference. There is a statistically significant difference between these two methods; The results of their study are consistent with the present study (33). But in their meta-analysis, Chang et al. State that due to the difference between the mannequin and the normal patient, the method of intubation in them and the results of their training will also be different, and it is natural that intubation on the mannequin is much easier than the normal patient. Be; They also believe that in theoretical training, more attention is paid to the normal patient and less attention is paid to the training of the abnormal patient, and therefore people who have passed the theoretical training should get better scores on the mannequin than the normal patient. The opposite of what is seen in the present study; It should be noted that in the present study, considering that there was no statistically significant difference between the two groups A and B, but the scores of group A were somewhat lower than the scores of group B. The results of the present study are not consistent with their study and are contradictory (34). In the post-test, it was observed that there is a statistically significant difference between groups A and B, so that the scores of group A are higher than group B; The results of the present study are in line with the results of the study of Chang et al. Who believe that after teaching the theory in principle, it is natural that the training scores on the mannequin are higher than the normal person (34). On the other hand, Sarak et al. Believe that training on mannequins takes precedence over other methods.
of teaching practical skills, and after presenting theory lessons, training should be done on
mannequins; In their study, as in the present study, the educational score obtained in the group
trained with mannequins was higher than other methods, which is consistent with the present study
(35). In the study of Baker et al., The use of the method of teaching on mannequins is emphasized
and their study states that students who receive training with mannequins have higher self-
confidence than others; In their study, as in the present study in the educational method on the
mannequin, the highest score was obtained, which is consistent with the present study (36). In his
comparative study of intubation training methods, Yang concluded that students who train their
skills on patients receive the best type of training; Also, the authors of the mentioned article believe
that students who teach patients are more sensitive than others to do their skills correctly and in a
way they feel obliged to do the skills correctly; In their study, unlike the present study, helping
patients to teach clinical skills had the highest score compared to other methods, which contradicts
the present study (37). In a review of intubation teaching methods, Sun et al. State that each method
is unique to the student who uses it; in fact, they believe that each student should use the method
Special training was used to minimize students' stress during practical skills training. In their study,
it is recommended to use all available methods for a student and not just one method. They also
state that teaching clinical skills to patients will lead to better education and the person will achieve
better skills, which is contrary to the present study and contradicts the present study (38).
In the present study, group A students did not score better after the intervention than before the
intervention and their scores after the intervention are statistically significantly different from
before the intervention. It seems that using mannequins several times has improved their score.
Adinka et al. Also did not observe in their study that the students' score after the intervention was
statistically significantly different from before the intervention, which is consistent with the
present study (39). In their study, Kay and Silver did not observe a statistically significant
difference before and after the intervention and stated that the use of mannequins reduces the
sensitivity of students to the correct performance of the skill and they do not pay much attention
to how to perform the skill. The results of their study are not consistent with the present study (40).
There was no statistically significant difference between the pre-test and post-test scores in the b-
test and only the mean obtained after the intervention is slightly less than the intervention; Given
that there were no specialized studies in this field, the researchers believe that awareness of
operating room stress as well as fear of endangering the patient's life can cause this decline.
Conclusion

In the present study, intubation training on mannequins scored higher than the normal patient, and the researchers of the present study conclude that before intubation and any practical skills, students have passed the theory units well and then learned the skills. Practice on mannequins and finally improve their skills on patients, and before any practical action on the patient, it is necessary to perform practical skills on mannequins.

References


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