

A Systematic Review of Domestic Research on Clinical Practice in Emergency Medical Technicians

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Abstract

This study analyzes research trends by systematically examining research about domestic emergency medical services' clinical practice, and it is aimed to present the basic data needs in development plan in clinical practice education in the future.

The thesis was searched through the electronic data research (Science Direct, PubMed, Medline, and 55 academic DB interworking) from the library of Konyang University from 2010 to 2021. The main keywords were "Emergency Medical Technician(EMT) Student" and "Clinical Practice," and 6 pieces of researches were selected, finally.

As the result of analyzing the qualitative level of selected research, all the 6 pieces of research subjects(100.0%) were pertinent to level IV(survey research) which is low-qualitative level. As the principal subjects, "Clinical practice experience" got the highest frequency as 6(100%), "Satisfaction of clinical practice" was 3(50%), "Self-efficient, Major satisfaction" and "Stress, Depression, Coping" showed 2 (33.3%), and "Change after clinical practice", "Clinical practice improvement plan" was 1(16.7%) each.

From this time on, it is confirmed that the quantitative and qualitative growth in domestic emergency medical clinical practice is necessary. This is expected to contribute to establishing a practical and systematic development plan of clinical practice education..

Keywords: Emergency Medical Technician Student, Clinical Practice, Paramedic Education, Systematic Review

1. INTRODUCTION

Emergency Medical Technician(EMT)s are divided into EMTs-level 1 and EMTs-level 2, and The Emergency medical personnel who provides the emergency medical service to an emergency patient is in charge of advanced airway intubation, securing of an intravenous route, and medication to the emergency patient in accordance with the level of qualifications [1]. EMTs-level 2 are acquired by completing a professional training course at a training institute for emergency medical technicians and EMTs-level 1 are qualified by passing an examination conducted by the Nation after graduation of the university of junior college with a major in emergency medical technology. In 1991, EMTs-level 1 were started to train on eleven universities throughout the country and had been training on 41 universities so far. As of December 2019, there were a total of total 40,785 EMTs: 20,588 EMTs-level 1 and 20,197 EMTs-level 2 [2].

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EMTs-level 1 university offers ambulance ride practice and clinical field training, also, EMTs-level 2 are to fulfill each 50 hours of ambulance ride practice and emergency medical institution practice, during the training curriculum, which are defined by law. Paramedic students understand the experience of various patient case, the role of emergency medical system and EMTs in the clinical field training, generate professional pride as future EMTs, and make a transition point to decide career after graduation through the practical training course, and establish a framework of competence as future professional EMTs [3-5].

In case of the United States, to be a Paramedic, it is required to complete 1,000 to 1,200 hours of training including 4-step authorized programs (theoretical lectures, practical skills, clinical and field practice, field practice (internship) and to perform the required number of objectives of paramedic clinical instruments, according to the National Standards Curriculum. EMTs in Taiwan demand 480 hours of hospital internship. Also, nurses prepare the program that can carry out various clinical practices, which is to complete 1,000 hours of clinic training in superior general hospitals, general hospitals, special hospitals, etc., and to practice in public health centers, school health centers, and industrial health center. Occupational therapists, in addition, encourage to implement more than 1,000 hours of clinical practice, or at least 2 months at the Korea Pavilion under the World Federation of Occupational Therapists (WFOT) curriculum evaluation certification criteria [3,6,7].

In case of Emergency Medical Technicians (EMT), however, the 2nd Grade EMT training courses is defined by the law as 50 hours, the 1st Grade EMT from the college has no regulation on the time and contents: 2 of 70% clinical training sessions are conducted in case of a three-year college, and 3 of 73.3% practice sessions and 161.68 hours of a clinical training for an average of 4.3 weeks in a university (a four-year college). As such, the education program is not standardized in the EMT courses, formal practice (inspection ceremony) is being conducted without appropriate program for clinical practice, so systematic clinical ability cultivation is not achieved and sufficient clinical training is not experienced, so it is reported that there is a lack of confidence and passive attitude in the evaluation and treatment process of emergency patients before the hospital [6,7].

In order to achieve the curriculum standardization and the learning goal of clinical practice for improvement of quality and efficiency of the training course for EMT, it is judge that a lot of studies need to be conducted. By comparatively analyzing the data for Korean EMT related with clinical practice after 2010, this study is aims to present basic data to explore the development plan of clinical practice education.

2. METHOD

2.1 Study design

This study aimed to select the analyzed subject research as a comprehensive literature retrieval method and to conduct systematic consideration to synthesize the results through an objective process. It was analyzed through the methodical consideration about the study on the local Emergency Medical Technician (EMT) and clinical practice.

2.2 Data Collection and Criteria for Study Selection

For data collection, this study researched the thesis through the electronic data research (Science Direct, PubMed, Medline, and 55 academic DB interworking) from the library of Konyang University from 2010 to 2021. The main research terms were “Emergency Medical Technician Student” and “Clinical Practice.” The researched paper was selected according to the exclusion criteria of this study.

Like Fig. 1, 1,028 documents were found in the first research, 35 studies were selected by reviewing these titles and abstracts, and 6 studies were selected by 2 authors using the Covidence Systematic Review

Management program(covidence.org, <https://www.covidence.org/>) to select the paper that fit the review process.

2.2.1 Criteria for Selection

- A. A Study on the journals published between 2010 and 2021
- B. A Study on Emergency Medical Technicians in Korea
- C. A Study on Clinical Practices in Clinical Institution (Hospitals), not in a school.

2.3 Analysis Content and Method

2.3.1 Qualitative level of Research

Quality of the study (New Pyramide Evidence) analysis model was used to evaluate the qualitative level of the analysis object research. The 5-step analysis classification method of the level of evidence presented by M.H. Murad, N. Asi, M. Alsawas, F. Alahdab was used [8]. The 5-step analysis classification method means that the higher the level I to V, the lower the level of evidence of the study. This analysis model is classified into the order of the level of evidence with the high quality of study: Level I (Systematic Review, Meta-Analysis), Level II (Randomized Contrial Trial), Level III (Cohort Studie), Level IV (Case Control Studies), Level V (Case Series/Report).

2.3.2 Analysis of Major Variables Related to Research Trend and Clinical Practices

In order to analyze the trends of the final 6 studies, the study method analysis, analysis the main theme of the study, and analysis the main variable of the study were conducted. The research method was analyzed by analyzing the data collection method, the main theme analysis was classified into four categories: "Clinical Practice Satisfaction", "Changes in Clinical Practice (Recognition, First Aid Performance Capability, etc.)", "Factors that affect Clinical Practice Satisfaction", and "Improvement Plan for Clinical Practice Education". The main variable analysis was conducted to analyze the variables affecting the EMT's clinical practice such as independent variables, dependent variables, and mediator variable of the analysis object study.

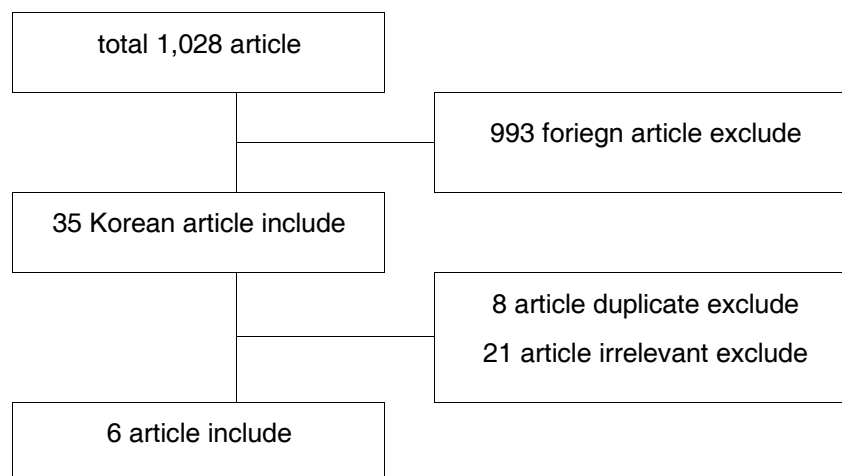


Figure 1. PRISMA flow diagram

3. RESULT

3.1 Qualitative level Analysis of the Study

The result of analyzing the Qualitative level of 6 research analysis subjects of this study was as followed: Level V(Case Series/Report) which dissolves 100% as shown in Table 1.(Table 1)

Table 1. Qualitative Level of research

Level of evidence	Definition	Frequency n(%)
I	Systematic Review, Meta-Analysis	0(0.0)
II	Randomized Contrial Trial	0(0.0)
III	Cohort Studies	0(0.0)
IV	Case Control Studies	0(0.0)
V	Case Series/Report	6(100.0)
Total		

3.2 Methods and Main Theme

The most common method of the study was 5 Frequency(83.3%) in Survey, and 1(16.7%) Experimental Study. The main theme of the study, in addition, showed 2(33.3%) in satisfaction of clinical practice, which is the most common, 1(16.7%) change after clinical practice, 1(16.7%) clinical practice stress, and 1(16.7%) self-efficacy and major satisfaction, for each(Table 2).

Table 2. Research Method and main theme Analysis

	categories	Frequency n(%)
Method	Survey	5(83.3)
	Experimental Study	1(16.7)
	Total	8(100.0)
Main theme	satisfaction of clinical practice	2(33.3)
	clinical practice improvement plan	1(16.7)
	clinical practice stress	1(16.7)
	change after clinical practice	1(16.7)
	self-efficacy, major satisfaction	1(16.7)
	Total	6(100.0)

3.3 Major Variables Analysis of the Study

The major variables analysis related to EMT's clinical practice of the analysis object study is the same as table 3: Clinical practice experience 6 Frequency(100%) which the highest, Satisfaction of clinical practice was 3(50%), self-efficient, major satisfaction and stress, depression, coping (both) were 2(33.3%) , and change after clinical practice and clinical practice improvement plan showed 1(16.7%), for each (Table 3), (Table 4).

Table 3. Major variables analysis

	①	②	③	④	⑤	⑥	Frequency n(%)
satisfaction of clinical practice	●	●	●				3(50.0)
clinical practice experience	●	●	●	●	●	●	6(100.0)
clinical practice improvement plan			●				1(16.7)
self-efficient, major satisfaction					●	●	1(16.7)
stress, depression, coping		●			●		2(33.3)
change after clinical practice				●			1(16.7)
	2	3	3	2	3	2	

Table 4. Characteristics of study

No	Author (yr)	Evidence Level	Research Method		main theme	major variables	main outcome
			data Collection	Sample Size			
1	Choi. s. s. [9] 2012	IV	survey	344	satisfaction of clinical practice	satisfaction of clinical practice	enhance EMT students' satisfaction in clinical practice, students should have clear points of view on their job and practice beginning grade and practice period should be properly considered according to characteristics of students. Also, effective practice programs which carefully consider peculiarity of Emergency Medical Technology should be developed further.
2	Koh. B. Y, Lee.J.E [10] 2012	IV	survey	221	satisfaction of clinical practice	stress, depression, coping behavior satisfaction of clinical practice	There was a positive effect on decreasing stress and depression in paramedic students, and encouraging positive coping when the students received counseling and instruction for clinical

3	Jung. S. W [11] 2017	IV	survey	115	improvement of clinical practice	satisfaction of clinical practice improvement of clinical practice	Sophomores, who experienced only ER have a negative view about their future job prospect. On the other hand, juniors, who experienced ER and 119 rescue team have not virtually changed the way they view their future job prospect, supposedly due to the halo effect of the 119 rescue team clinical practices. Both groups wish to have opportunities to experience diverse clinical practices.
4	Oh. Y. J et al. [4] 2018	IV	before and after study	81	change after clinical practice	CPR Performancs and recognition	Hospital based clinical practice of paramedic students could provide extra confidence in student's ability to perform CPR and lead to adequate chest compression depth.
5	Kim D. W., Kim Y. R. [12] 2020	IV	survey	243	clinical practice stress	Ethical values, Self- esteem clinical practice stress	reduce the stress of emergency medical service students' clinical practice educational support from schools that can improve ethical values and self-esteem is necessary.
6	Kim Y. R, Kim D. W. [13] 2021	IV	survey	58	self- efficient, major satisfaction, paramedic image	clinical practice self- efficient, major satisfaction, paramedic image	students who experienced clinical practice had a higher level of clinical practice self-efficacy than those who did not experience clinical practice.

4. DISSUSSION

This study is to comprehend the research trends through the systematic consideration of the domestic Emergency Medical Services (Technicians)' clinical practices. This study aims to present basic data for the improvement of Emergency Medical Technicians' practical skills and educational development of clinical practices through the development of clinical training related to the program development and related to the policymaking.

First, the qualitative level of the research related to emergency medical services' clinical practice in this study was fully equivalent to level V (Case Series/Report) that all of 6 Frequency were included in it. Survey Research was 5(83.3%), the highest among them, and Single Experimental Studies got 1(16.7%), which is to compare before and after the clinical practice. It is not a systematic consideration for emergency workers and paramedics, but it looks a lot like 75% of the survey study[6] on occupational therapists and 71.4% of the research on systematic consideration[13] of nurses. However, in the study of occupational therapists, qualitative research method using interview method(n=2) was applied. In the study of nurses, experimental

research(n=7) and qualitative research(n=6) are increasing, so it is necessary to actively conduct various types of research such as qualitative research as well as quantitative research for surveying satisfaction and stress through emergency rescue and clinical practice experience.

Second, the title of the study related to emergency medical services' clinical practice showed 2 frequency, the highest, with Satisfaction of Clinical Practice(33.3%), and 1(16.7%) for change after clinical practices, 1(16.7%) for clinical practice stress, 1(16.7%) for self- efficient and satisfaction, respectively. In the study of occupational therapists, it showed satisfaction of clinical practice as (50%), change after clinical practice and educational system as 25%, each. The study for nurse was confirmed to have various studies different from the research domain of emergency medical services and occupational therapy, such as perception area(n=4) and development of practical evaluation tool (n=2) about clinical practice stress and major satisfactions in clinical practice. However, studies related to these clinical practices focused on the perception of participants and was corresponding to its theme by including factors affecting students' perception and practice. Therefore, studies on emergency medical services and its clinical practice are still insufficient that various studies related training should be actively conducted. Based on this, meta-analysis will be able to synthesize previous studies in a more systematic way.

Obligated to implemented more than 250 to 300 hours of clinical practices and 250 to 300 hours of Ambulance ride practice in a systemized and standardized program to become a Paramedic in the United States[7]. During the training, 30 times of practice must be completed as many times as regulation stipulates and be confirmed by the educational director. The regulations on each item and number of sessions vary by State. On the other hand, there is no regulation or standard for clinical practice and ambulance ride practice to 1st grade EMTs in Korea. The training period and content are variously progressed by training institutions, that is necessary to establish institutional basis for the standardized clinical practice[11]. Also, it concludes that the study for competency definition and essential items necessary for clinical practices is essential to establish such institutional foundation.

5. CONCLUSION

A chosen studies in this research emphasized the necessity of clinical practice by showing that the technique is improved through the clinical practice and so do satisfaction and self-efficacy. However, it was confirmed that the necessary in growth of quality and quantity in clinical practice related to emergency medical services, such as the practical evaluation method that is not yet institutionalized, the clinical practice environment, and the necessity of preparing the standard guidelines for clinical practice. Based on this study, it is expected that it will contribute to establish systematic development plans for clinical practice education in the future.

The lack of subject to analysis could be the limitation, since there are no active studies on the domestic clinical practice of emergency medical services. various clinical practice-related studies should be actively conducted from now on, and if meta-analysis were conducted based on this, it would be able to be synthesized in a more systematic way. If many studies are conducted, systematic consideration including overseas research will be conducted to provide a better direction for domestic clinical practice research through comparative analysis of domestic clinical practice and overseas clinical practice research.

A various study will proceed by securing basic data for development of guideline, study related to effectiveness, improvement plan of clinical practice environment in terms of clinical environment and educational environment to come up with educational goals, educational methods, its content, evaluation methods, evaluation contents for each stage of clinical practice, based on these studies.

Also, based on the diverse studies for the ideal clinical practice education system and guidelines, it is expected that practical and systematic clinical practice education will be achieved, and the practical capacity of emergency medical technicians will be further improved.

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