What to prepare to be an ambulance nurse? Scoping review of ambulance nurse competencies

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A B S T R A C T

Delays in handling emergency management at the prehospital scene are still a challenge for prehospital officers in Indonesia. There needs to be a standard of ambulance nurse competence to improve the quality of prehospital nursing care and increase the patient's survival rate. The purpose of this study was to identify an ambulance nurse's competence in handling prehospital emergency cases. The preparation of this scoping review is based on 4 databases, namely ProQuest, EBSCO, Science Direct, and Pubmed. The strategy for determining article search keywords is carried out by the PICOS method. From the database search result, 161 articles were obtained (ProQuest n=31, EBSCO n=69, PubMed n=72, and Science Direct n=77). The screening process of the search result used the PRISMA method by removing duplicate articles and selecting the articles that do not match the purpose. After the screening process, there were 13 articles that discuss an ambulance nurse's competence. There were 6 ambulance nurse competence areas: procedural skill, assessment of the situation, professional knowledge, communication, resource utilization, and decision-making. This study showed the need for specific validation that discusses an ambulance nurse's competence in handling emergency cases at the prehospital scene.

A B S T R A K

Keterlambatan penanganan kgawatan pada tahap prehospital masih menjadi tantangan petugas prehospital di Indonesia. Perlu adanya standar kompetensi perawat ambulans sebagai pemberi layanan kegawatan prehospital untuk meningkatkan kualitas pelayanan perawatan prehospital dan meningkatkan angka kelangsungan hidup pasien. Tujuan dari penyususnan scoping review ini adalah untuk mengetahui kompetensi perawat ambulans dalam menangani kegawatan pada tahap prehospital. Penyusunan scoping review ini berdasarkan pada penelusuran 4 database yaitu ProQuest, EBSCO, Science Direct, dan PubMed. Strategi untuk menentukan kata kunci pencarian artikel dilakukan dengan metode PICOS. Dari hasil penelusuran database didapatkan 161 artikel (ProQuest n=31, EBSCO n=69, PubMed n=72, dan Science Direct n=77). Proses skrining hasil pencarian artikel menggunakan metode PRISMA dengan seleksi pada duplikasi artikel dan mengeluarkan artikel yang tidak sesuai dengan tujuan penulisan. Setelah dilakukan proses skrining didapatkan 13 artikel yang membahas kometensi perawat ambulans. Terdapat 6 area kompetensi yaitu keterampilan prosedural, penilaian situasi, pengetahuan profesional, komunikasi, pemanfaatan sumber daya dan pengambilan keputusan. Dari scoping review ini menunjukkan perluadanya validasi secara khusus yang membahas tentang standar kompetensi yang harus dimiliki oleh perawat

ambulans dalam penanganan kegawatan pada tahap prehospital.

INTRODUCTION

Prehospital services are described as the duration between an emergency call and the time to transfer patients to the health care facilities as needed (Strauss et al., 2021). Prehospital services might be needed in a complex situation and will require well-trained personnel (Abelsson et al., 2018). Some patients with emergency cases, especially with major trauma, die before arriving at the health care facility (Oliver et al., 2017). The key to the success of prehospital emergency services depends on a quick and appropriate assessment of the situation (Hoikka et al., 2018). The competence of prehospital officers is essential to reduce the risk of further disability and increase the survival rate of the patients.

Meanwhile, prehospital emergency services in developing countries, including Indonesia, are still not fully adequate (Reynolds et al., 2017). Since 2016, the Health Ministry of the Republic of Indonesia has inaugurated the integrated emergency management system program which is known as *Sistem Penanggulangan Gawat Darurat Terpadu* (SPGDT) (Kemenkes, 2016). In the implementation of SPGDT, the government requires the existence of Emergency Medical Services (EMS) in each city or district, which is known as Public Safety Center (PSC) 119, for emergency rapid response services. The purpose of this program is not only to serve accident cases but also to serve other critical cases (Kepmenkes, 2019). In addition to PSC 119, prehospital emergency services are carried out by an emergency ambulance of hospitals and first health facilities called *puskesmas*.

In developed countries such as Australia, prehospital services are performed by paramedics (AlShammari et al., 2018; Strauss et al., 2021). In Indonesia, there are no professional prehospital officers, so prehospital services are carried out by ambulance nurses (Suryanto et al., 2017). Most ambulance nurses do not have training experience in prehospital management. This condition occurs because the formal education curriculum of nursing schools still focuses on nursing in hospitals (Suryanto et al., 2018). In previous studies, the competence of ambulance nurses in Sweden and Norway was defined by nurses' skills in performing cardiopulmonary resuscitation (CPR), endotracheal tube intubation, ventilation, trauma care and triage (Abelsson et al., 2018). The purpose of this study is to identify the competence of ambulance nurses in handling emergency cases.

METHOD

This scoping review was conducted by collecting and mapping ideas, inspiration, and answers to evidence-based research questions in nursing (Larsen et al., 2019).

Inclusion Criteria

To obtain an article that fit the author's goals, the criteria of inclusion and exclusion are determined. The inclusion criteria for article recording are articles published in the range of 2012 and 2022, articles in English, articles with full-text access, and articles that had relevance to the purpose of this writing.
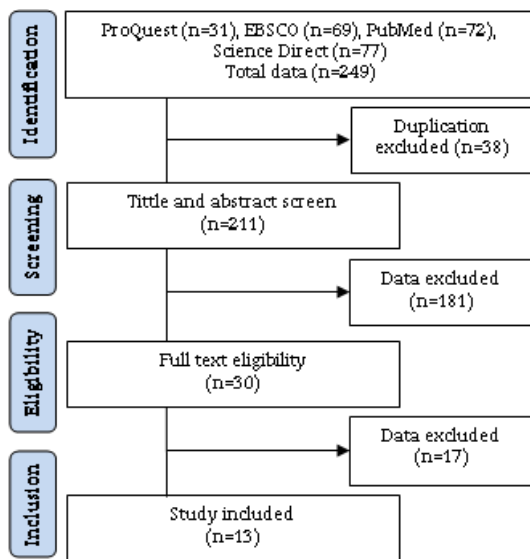
Search Articles

The preparation of this scoping review used the PICOS strategy to determine research questions and keywords (Jensen, 2018). The use of PICOS strategy is illustrated in Table 1. The keywords used in this scoping review are "ambulance nurse", "prehospital", and "competence". In the process of searching for articles, the author used the boolean "AND" and "OR". The article search process is carried out systematically by accessing the databases subscribed by our campus, namely ProQuest, EBSCO, Science Direct, and PubMed. The article search was conducted on May 21, 2022.

Table 1
PICOS table and keywords

Elements	Keywords	Search strategy
P (Population)	Nurse	Ambulance nurse OR Prehospital nurse
I (Intervention)	Prehospital care	Prehospital care OR Emergency care
C (comparation)	Not hospital	
O (outcome)	Nurses competence in handling prehospital emergency cases	Competence OR Skill OR Knowledge OR Practice
S (Study design)	Quantitative, Qualitative, Mix-method	

Articles Selection

Article selection was carried out systematically using the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) method. The PRISMA method is an evidence-based dataset of structured search results based on systematic review reporting and meta-analysis (Larsen et al., 2019). The selection of articles in the PRISMA chart was carried out by identifying titles and abstracts to ensure compliance with predetermined keywords. Furthermore, screening was carried out to issue duplication of the articles. The process of eligibility was carried out by identifying abstracts to ensure conformity with the author's goals. The article selection process is illustrated in figure 1.

Figure 1
The Flowchart of articles selection with the PRISMA method

RESULT AND DISCUSSION

Figure 1 shows that from the number of articles obtained by authors from databases, there were 249 articles with detail, 31 articles from ProQuest, 69 articles from EBSCO, 72 articles from PubMed, and 77 articles from Science Direct. From 249 articles, the author excluded 38 duplicate articles. Furthermore, the author screened the articles by adjusting the title and abstract according to the keywords and obtained 30 articles. Then 30 articles were included into the eligibility full-text process. The last step of the prism chart was to obtain 13 articles that matched the search criteria and the purpose of writing this scoping review. The analysis of 13 articles can be seen in table 2.

Table 2
Summary of included studies

Author, country	Study design	Population and sample	Purpose	Result
(Abelsson & Lindwall, 2012a), Sweden	Qualitative phenomenologic	15 ambulance specialist nurses with at least 2.5 years of work experience	Describe the perception of severe trauma patients' assessment from the ambulance nurses	The perceptions from an ambulance nurse to assessing severe trauma patients are: - Prepare for emerging situation: assessment for the situation, prepare to act based on the patient's condition, confirmation and validation of the assessment result. - Leadership: responsibility and ability to combine theory and practice - Develop professional knowledge: interprofessional collaborative
(Abelsson et al., 2018a), Sweden	Quantitative, Cross sectional	63 ambulance nurses	Assess the ambulance nurses' competence in prehospital emergency trauma care	The author used the Global Rating Scale (GRS) to measure the ambulance nurses' competence. Ambulance nurses had a good theoretical and practical skill and knowledge. The competencies of ambulance nurses measured by simulation are: - Assessment - Examination - Care action
(Aghaie et al., 2021), Iran	Quantitative, Cross sectional	230 emergency nurses	Identify the ambulance team competence and readiness to care of trauma patients	The nurse experience in training have contribution to their level of readiness and teamwork competency
(Castrèn et al., 2017), Finlandia dan Swedia	Quantitative, Cross sectional	41 nurse students (19 from Finland, 22 from Sweden)	Identify the impact of interprofessional education (IPE) and interprofessional collaboration (IPC)	Measuring nurse competence with Nursing Professional Competence (NPC) scale had a good result. Students from Finland have a higher score in IPC

			program on prehospital emergency case nurses' competence	
(Daggenvoorde et al., 2021), Netherlands	Qualitative explorative	14 ambulance nurses	Explore the experience in emergency care of acute manic patients	Emergency care of patients with psychiatric symptomp was stressand uncomfortable situation for ambulance nurse. They lack of patients information and need more specific education. To improve quality of care they have to collaboration with other professionals.
(Falk & Lindström, 2022), Sweden	Quantitative, Cross sectional	62 registered nurses (RNs) who admitted to advance level training	Explore clinical competence of RNs by themselves before entering training	Nurse competence measured by Nursing Professional Competence (NPC) scale. They lack competence in the documentation of patients' psychological status, application of treatment principles to disaster and emergency situations, and search for relevant literature for evidence-based nursing
(Jansson et al., 2020), Sweden	Quantitative, Cross sectional	34 registered nurses (RNs) and 71 specialist nurses	Identify and compare professional competence among ambulance nurses reported by themselves and its factors associated	Nurse competence measure with Ambulance Nurse Competence (ANC) scale. The result showed that medical technical care had a higher score and the lowest score at research and development.
(Nilsson & Lindström, 2017), Sweden	Qualitative, 2 focus group discussions	20 students who admitted to ambulance station	Explore the students' perception about ambulance nurses' skills	Two themes about nurse professional skills: - Professional skills: assessment of patients, planning for the care, and continuous evaluation of action - Holistic approach to care: cultural, social, and ethical aspects of caring; collaboration with the patients for decision making; and care provided at patients home
(Nilsson et al., 2020), Swedia	Quantitative, Cross sectional	179 specialist ambulance nurses and 34 specialist ambulance nursing students	Develop and validate a new instrument to measure the competence of ambulance nurse which can be self reported	The author used the ambulance Nurse Competence (ANC) scale to measure the competence. The ANC can be used to measure the competence of nursing students undergoing ambulance nurse specialist programs
(Sjölin et al., 2019), Sweden, Finland, dan Belgium	Qualitative, deductive multiple-case-study	2 teachers from each university and country, Sweden, Finland and Belgium	Identify common core curricula for registered nurse in ambulance care	Three main categories: - Medical knowledge - Nursing knowledge - Contextual knowledge
(Suryanto et al., 2018), Indonesia	Quantitative Cross sectional	465 nurses from 45 health centers in Malang	Identify prehospital knowledge, attitude, and practice among ambulance nurses	Participants had a high score for attitude and had a low score for knowledge. The training experience had a significant contribution for knowledge, attitude and practice score.
(Todorova et al., 2021)	Mix-method	7 ambulance nurses	Identify perception of knowledge and competence attending patients with psychiatric symptoms for prehospital emergency ambulance specialist nurse	There was insufficient knowledge regarding psychiatric illnesses among ambulance nurses. Expectations for the future: - Build collaboration - increase knowledge - improve quality of care to the patients
(Wihlborg et al., 2014), Sweden	Quantitative, Modified Delphi technique	37 panel experts	Describe professional competence of an ambulance specialist nurse from the point of view of panel experts	Competence area from the expert panel: - perform leadership: manage and supervise a team in a large accident or disaster - good communication - general aptitude: flexible, adaptive, problem solving, and autonomous - collaboration - pedagogic skills - deep knowledge - professional judgement and skills - research activities - technical skills

Table 2 shows the evidence from developed countries eg. Belgium, Finland, and Sweden. The analysis of articles originating from the countries showed that until now there has been no specific consensus that discusses the competence of nurses, either from governments or from other developing countries (Nilsson et al., 2020). In most developed countries, such as Australia and America, and even in Asian countries, Emergency Medical Services (EMS) are carried out by Emergency Medical Technicians (EMTs) or paramedics (Abuzeyad et al., 2020; AlShammari et al., 2018a; Strauss et al., 2021). In comparison, in some developed countries in Europe, EMS is performed by ambulance nurses (Wihlborg, 2017). The education system and health workforce in Indonesia currently do not recognize the term paramedic or EMT (Suryanto et al., 2017). Prehospital emergency services in Indonesia are performed by ambulance nurses.

From the results of the article search, several instruments were obtained which were then used as a benchmark in determining the competence of ambulance nurses. The Global Rating Scale (GRS) is an instrument to measure paramedic clinical competence. There are 7 dimensions of competence areas contained in GRS (Abelsson et al., 2018; Tavares et al., 2013). In addition to GRS, the instruments used in determining the competence of ambulance nurses were Nursing Professional Competence (NPC) and Ambulance Nurse Competence (ANC) (Castrèn et al., 2017; Jansson et al., 2020).

Communication

Communication is one of the core components in providing quality care to gain the trust and appreciation of patients. Proper and effective communication is needed by nurses to get as much complete information as possible from the patients (AlShammari et al., 2018). Communication is defined as the nurse's ability to listen and to communicate verbally or nonverbally with the patients at the scene (Abelsson et al., 2018). In addition to establishing communication with patients, ambulance nurses must also be able to communicate with family or witnesses, other officers such as police, and health workers both at the scene and at the intended health facility (Wihlborg et al., 2014). The more prehospital information obtained by the nurse, the more it will be able to help the next treatment process. Some authors suggest including communication skills as one of the basic competencies that ambulance nurses should possess (Falk & Lindström, 2022; Nilsson et al., 2020; Wihlborg, 2017).

Professional Knowledge

Knowledge is identical to the results of the educational process taken by nurses both from the academic level and the professional level. Professional knowledge is associated with the mastery of the nursing process independently. The nursing process starts from the assessment to evaluation included discovering certain cultures and beliefs (Castrèn et al., 2017; Nilsson et al., 2020). Professional knowledge focuses on how work strategies change based on the competence of colleagues and the need for the development of competencies and skills (Abelsson & Lindwall, 2012). Prehospital knowledge of ambulance nurses included the understanding of how to manage patients at the scene, how to transport the patient to the health care, and how to manage emergency cases (Suryanto et al., 2018). Professional knowledge reflects a deep knowledge of the nursing care,

emergency nursing, and emergency or prehospital nursing management (AlShammari et al., 2018). Another author said that research activities are included in activities that can support the knowledge of ambulance nurses. Search for evidence-based practice can support ambulance nurses in improving the quality of nursing care (Todorova et al., 2021).

Procedural Skills

The result table shows that the dimension of procedural skills is widely used to measure the competence of ambulance nurses. Procedural skills are defined as the ability of the nurse to perform psychomotor skills and the ability to adapt to the emergency case encountered at the scene (Abelsson & Lindwall, 2012). The procedural skills that ambulance nurses must have are emergency management in various cases, including patients with mental illness (Todorova et al., 2021). Other authors use the term technical skills to describe nurses' competence in performing procedural skills which is related to the ability to perform pre-hospital practices such as performing CPR, airway management with maneuvers or with the aids, trauma emergency management, and other psychomotor skills (Abelsson et al., 2018; Suryanto et al., 2018). The quality of procedural skills can be improved through repetitive practice or simulation (Abelsson et al., 2017).

Decision Making

Clinical decision-making is very important during emergency calls at the scene. Decision-making is defined as the ability to determine priorities, security, and effective plan management (Tavares et al., 2013). Decision-making is concerned with the ability to think based on supporting findings, risk consideration, appropriateness, and diagnosis enforcement (Abelsson et al., 2018; Nilsson et al., 2020; Tavares et al., 2013). In making decisions on patients who are treated, ambulance nurses are required to be able to use critical thinking skills in emergency situations, especially if patients who are treated at the scene are not accompanied by their family or relatives (Aghaie et al., 2021). The decisions made include whether to carry out treatment actions at the scene or treatment actions on the way to the health facility as needed by the patient (AlShammari et al., 2018).

Teamwork and Collaboration

The concept of prehospital emergency management carried out by nurses cannot be separated from collaboration with various parties. The prehospital system is associated with an interdisciplinary team (Abelsson & Lindwall, 2012). During nursing education, it is important to take an interprofessional education (IPE) approach to foster collaboration between students (Astuti et al., 2021; Conte et al., 2022). Interprofessional collaborative approaches in healthcare are closely related to issues or policies on patient safety (Castrèn et al., 2017; Slater et al., 2022). Ambulance nurses must be able to establish institutional collaborations, for example collaborating with police, fire, and other emergency services institutions. For example, in an accident, it is possible that ambulance personnel arrived at the scene after security by other field officers such as the fire department and police (Wihlborg et al., 2014). Building teamwork with various parties is necessary to explore secondary information needed to ascertain the events that happened to victims (Aghaie et al., 2021). In addition,

ambulance nurses must be able to collaborate with the patient's family or relatives. In certain cases, such as emergencies in patients with mental disorders, the closest person to the patient can help control the situation (Daggenvoorde et al., 2021; Todorova et al., 2021).

Leadership

The nurse's leadership in prehospital management is the ability to combine theory and practice. The focus and responsibility of nurse leadership are to ensure the safety of personnel and patients at the scene (Kuzovlev et al., 2021). Nurses are also responsible for managing the desire of the fire department or police department to work faster and their need to handle the patients in a balanced condition and respect each other's capabilities and roles (Abelsson & Lindwall, 2012). The ability to perform leadership needs to be trained in the nursing education curriculum (Castrèn et al., 2017; Forsell et al., 2020). The nurse's leadership role in pre-hospital emergency services is to perform human resource management. Supervision to members of the teamwork is important for a leader to do in order to create a good team partnership (Wihlborg et al., 2014).

CONCLUSION AND SUGGESTION

This study has provided insights into the scope of knowledge, abilities, skills, and education that can be important for the behavior of nursing students. The results of this study also recommend follow-up by validating research to obtain basic competencies of nurses in accordance with evidence-based practices in the field.

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ETHICAL CONSIDERATION

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Conflict of interest

The authors had no competing interest either financial or non-financial in this study, and there were no ethical issues related to this study.

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