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Nursing Competencies in Ambulance Needs at Prehospital: A Scoping Review

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Abstract

Prehospital care has historically provided medical care with the aim of saving lives and preventing disability. Prehospital services that are accommodated by ambulances have complex and unpredictable care arrangements, so ambulance personnel, namely nurses, must prepare themselves to deal with all situations and conditions. This study aims to describe the competencies possessed by nurses while on duty in prehospital ambulances. This research is a literature study from several databases, and we obtained 20 articles for analysis. The results of the article analysis show that nurses who work in prehospital ambulances must have the competence to be able to save patients' lives, which is formed from knowledge, attitudes, and skills. Knowledge that must be possessed by ambulance nurses includes assessment, triage, and situation analysis. The positive attitudes of ambulance nurses include decision-making, communication, collaboration, caring, ethics, and culture. The skills possessed by ambulance nurses are BHD, intubation, examination of vital signs, interpretation of supporting examinations, and drug management. Ambulance nurses can improve their emergency care competencies through continuous education and training.

Keywords: Prehospital, Ambulance, Nurse, Competencies.

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1.   INTRODUCTION

Prehospital care has historically provided medical care with the aim of saving lives and preventing disability (Waldrop et al., 2020). Prehospital emergency services that begin with an emergency call to an emergency service centre are a very important part of the health care system (Forslund, 2007). Prehospital care has been described as early care, high quality first aid provided to a sick or injured patient starting from the moment an emergency call is received through to treatment at the scene or during ambulance transport to a medical (Nilsson et al., 2020).

Prehospital services accommodated by ambulances have complex and unpredictable care arrangements so that ambulance personnel, namely nurses, must prepare themselves to deal with all situations and conditions (Sjölin et al., 2020). There are generally two types of ambulances, namely emergency ambulances and transfer ambulances. An emergency ambulance refers to an ambulance that has the equipment to carry out resuscitation and the necessary medications. So, the patient still gets help during the transportation process. Transfer-type ambulances can be used to transfer relatively stable patients to the hospital. During the transfer process, only a few simple treatments can be performed such as infusion, oxygen inhalation, haemostasis, and splinting (Chen et al., 2021).

Nurses who work in ambulances should have emergency competence to be able to provide help to patients with complex conditions (Abelsson & Lindwall, 2012). Registered nurses have all responsibilities for care and treatment, which include patient assessment, decision-making, and evaluating the patient's condition (Colldén Benneck & Bremer, 2019). Until now, there has been no standard guideline regarding the competencies that nurses must have while on duty in an ambulance. In addition, nurses who work in ambulances only received basic emergency training, did not receive advanced emergency management, and did not receive formal prehospital care education (Suryanto et al., 2017). The data found in the field shows that nurses who work in ambulances have a diploma three educational background and the nursing profession.

Therefor it is necessary to have a literature discussion about the competencies that nurses should have to be able to serve in prehospital ambulances. This literature study aims to describe the competencies possessed by nurses when working in prehospital ambulances.
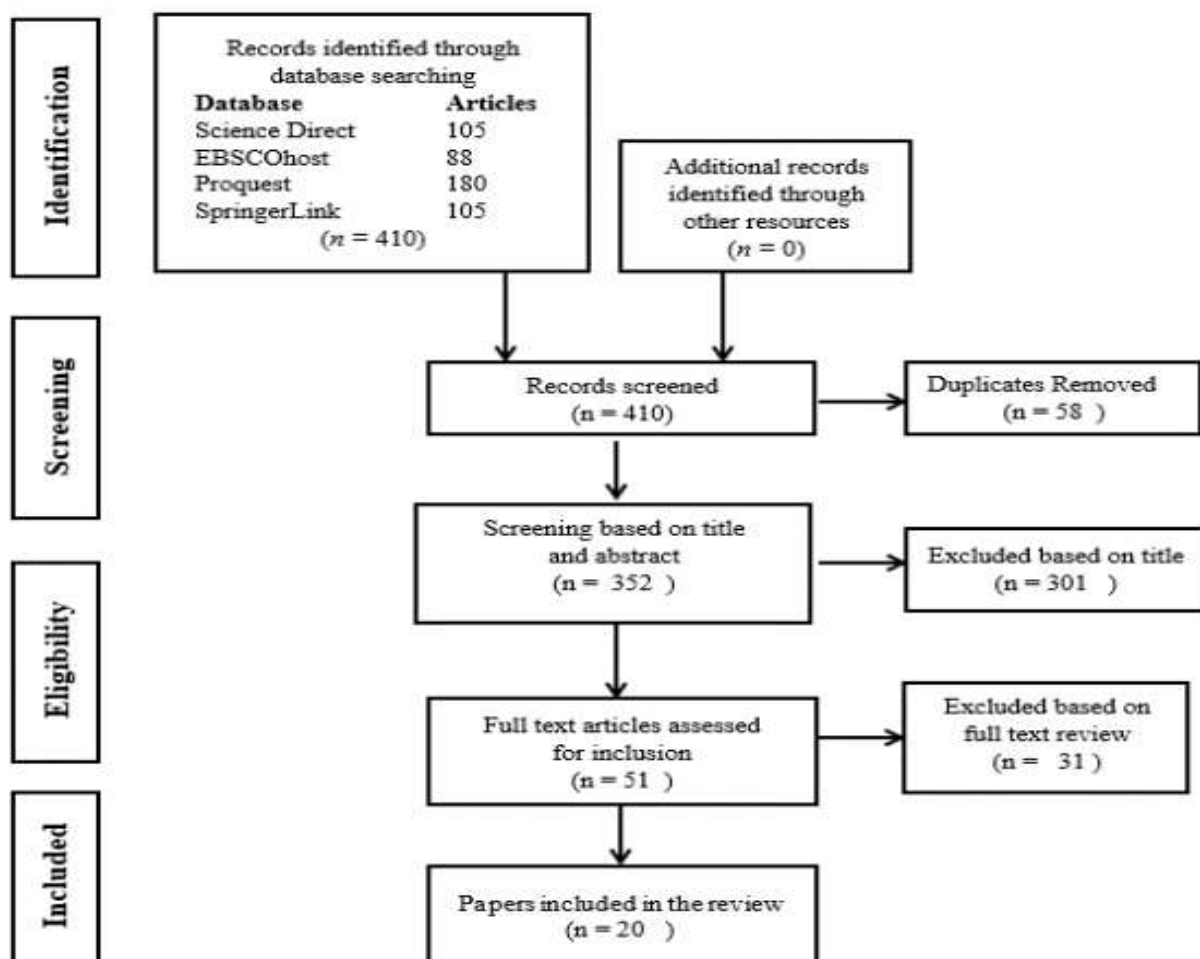
2.   RESEARCH METHOD

This research is a literature study using several electronic databases, including Science Direct, ProQuest, SpringerLink, and EbscoHost. The selected article discusses the competence of nurses in ambulances with the keywords "*nurse competence AND prehospital AND ambulance*". Inclusion criteria in the selection of articles to be analyzed include articles published from 2016 to 2021, review articles, or original research written in English. The article selection process is carried out by prism analysis according to the purpose of the article review.

3.   RESULTS AND DISCUSSION

After searching the literature from several databased using keyword, it was found that there were 410 articles consisting of 105 articles on science direct, 88 articles on ebscohost, 180 articles on ProQuest and 105 articles on springer link. After the screening process and abstract analysis were carried out, 20 articles were obtained which were analysed in full text to answer the research objectives. Researchers classify the competencies possessed by nurses who work in ambulances are divided into knowledge, attitudes and skills of nurses.

In general, nurses who work in ambulances should have competencies that have the main goal of life saving. The results of the literature review show that the knowledge possessed by nurses when serving in prehospital ambulances includes knowledge of triage, assessment (patient self-care; psychiatry; critical conditions; patient medical history; and medical assessment), knowledge in utilizing resources, understanding in conditions of care. emergency and critical care, understanding of the environmental situation, interpretation of the patient's condition and education. Attitudes that must be possessed by nurses on duty in prehospital ambulances include good decision making, therapeutic communication, collaboration, paying attention to cultural, social and ethical aspects, caring feelings, awareness of the patient's situation, implementing value-based nursing, and maintaining patient confidence. Meanwhile, the skills possessed by nurses on duty in prehospital ambulances include: basic life support, intubation, cardiopulmonary resuscitation, ventilation, physical examination, airway management, ECG examination, examination of vital signs, skills according to procedures, ability to handle medical conditions and psychiatry, safe and effective care, laboratory examination, prehospital point of care ultrasound, comprehensive patient surgery, medical care and drug management, attention to patient safety and leadership.

Figure 1. Flow chart of article selection.

Table 1. Selected Research Article.

No	Study Reference	Title	Prehospital Ambulance Nurse Competence
1.	Abelsson et al. (2018)	• The Prehospital assessment of severe trauma patients` performed by the specialist ambulance nurse in Sweden - a phenomenographic study	• Interventions to saving lives • Handling speed • Intubation • Cardiopulmonary resuscitation • Ventilation • Triage • Patient assessment • Physical examination • Airway management • Decision-making • Communication • Resource utilization • Personal skills
2.	Todorova et al. (2021)	• Perceptions of ambulance nurses on their knowledge and competence when assessing psychiatric mental illness	• Collaboration • Assessment of possible psychiatric disorders • Assessment of psychiatric characters
3.	Boyle and Eastwood, (2018)	• Drug calculation ability of qualified paramedics: A pilot study	• Accurate drug administration calculations
4.	Coll-Badell et al. (2017)	• Emergency Nurse Competence in Electrocardiographic Interpretation in Spain: A Cross-Sectional Study	• Ability in electrocardiographic examination
5.	Vicente et al. (2021)	• Experience of using video support by prehospital emergency care physician in ambulance care - an interview study with prehospital emergency nurses in Sweden	• Assessment of patient self-care • Interprofessional collaboration • Decision-making
6.	Nilsson and Lindström (2017)	• Nursing students' perceptions of learning nursing skills in the ambulance service	• Professional skills o Assessment o Prioritizing, initiation of care and medical care o Evaluation of intervention

No	Study Reference	Title	Prehospital Ambulance Nurse Competence
			• Provide care by paying attention to cultural, social and ethical aspects • Decision making in collaboration • Caring
7.	Holmberg et al. (2017)	• The knowledge desired by emergency medical service managers of their ambulance clinicians – A modified Delphi study	• Knowledge in exploring patient situations holistically • Knowledge in assessing and providing patient care • Medical knowledge to study and treat different diseases • Knowledge in reviewing and providing treatment in critical conditions
8.	Hörberg et al. (2019)	• Challenging encounters as experienced by registered nurses new to the emergency medical service: explored by using the theory of communities of practice	• Able to make decisions independently with minimal resources and support
9.	Bremer et al. (2020)	• Translation and further validation of a global rating scale for the assessment of clinical competence in prehospital emergency care	• Situation awareness • History assessment • Patient assessment • Decision-making • Resource utilization • Communication • Procedural skills
10.	Axelsson et al. (2016)	• How the context of ambulance care influences learning to become a specialist ambulance nurse a Swedish perspective	• Spontaneously must be able to deal with any possible medical and psychosocial problems in an unexpected environment
11.	Tavares et al. (2016)	• Informing a Canadian paramedic profile: Framing concepts, roles and crosscutting themes	• Provide safe and effective clinical care • Focusing on providing integrated, safe and effective health care • Provide collaborative nursing care

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No	Study Reference	Title	Prehospital Ambulance Nurse Competence
			• Can provide patient education
12.	Sedlár (2020)	• Cognitive skills of emergency medical services crew members: A literature review	• Able to understand pre-hospital emergency situations that can change at any time • Able to collect patient situation and environment well • Able to interpret the patient's condition • Able to make decisions
13.	Rubenson Wahlin et al., (2016)	• Do male and female trauma patients receive the same prehospital care?: An observational follow-up study	• Provide emergency services without discriminating against patients
14.	Magnusson et al. (2020)	• Pre-hospital triage performance and emergency medical services nurse's field assessment in an unselected patient population attended to by the emergency medical services: A prospective observational study	• Triage • Clinical decision making • Care focus
15.	Nadim et al. (2021)	• Prehospital emergency medical technicians can perform ultrasonography and blood analysis in prehospital evaluation of patients with chronic obstructive pulmonary disease: a feasibility study	• Laboratory examination • Prehospital point of care ultrasound
16.	Dúason et al. (2021)	• Patient handover between ambulance crew and healthcare professionals in Icelandic emergency departments: a qualitative study	• Perform comprehensive and accountable patient operations
17.	Castrèn et al. (2017)	• The effects of interprofessional education – Self-reported professional competence	• Nursing care • Able to perform medical treatment and medication management

No	Study Reference	Title	Prehospital Ambulance Nurse Competence
		among prehospital emergency care nursing students on the point of graduation – A cross-sectional study.	• Able to provide education to patients • Maintain patient safety • Leadership
18.	Jansson et al. (2020)	• Prehospital care nurses' self reported competence: A cross-sectional study	• Nursing care • Value-based nursing process • Medical treatment • Understanding the emergency nursing environment • Understanding the nursing environment in critical conditions • Leadership management
19.	Vázquez-Casares and Vidal (2020)	• Specific competencies of prehospital emergency nursing: The views of Spanish university professors	• Able to measure and recognize life-threatening vital signs • Able to perform basic and advanced life support
20.	Yoon (2021)	• Development of emergency nursing care competency scale for school nurses	• Maintain patient confidence when providing emergency nursing care • Take action in accordance with the laws and regulations • Collect subjective and objective patient data quickly and systematically • Conducting data analysis that has been carried out thoroughly • Carry out emergency nursing care in accordance with evidence-based • Perform therapeutic communication and build a trusting relationship with patients

DISCUSSION

1.   Knowledge

The results showed that the knowledge possessed by ambulance nurses included assessment, triage, and situation analysis. Knowledge becomes a basis for a person in taking an action. The knowledge possessed by nurses is the basis for nurses' competence when working in prehospital ambulances. Assessment is the first step of the five nursing care processes. The assessment carried out by nurses must be comprehensive, systematic and ongoing regarding the condition, situation and needs of patient care. Kurniawan dan Hariyati (2019) stated that there are six factors that can influence nurses in conducting assessments. The six factors include specific abilities, clinical experience, patient safety culture, education level, team performance and health systems. Knowledge in conducting assessments will be directly proportional to the management of nursing care. The better the knowledge of emergency nurses in conducting initial assessments, the better they will be in conducting primary surveys (Massa, 2018). Knowledge of the assessment is needed, because the assessment is the first way to determine the patient's condition to be able to provide appropriate action.

Knowledge of triage is defined as a nurse's understanding of the process of sorting out emergency patient conditions to determine the priority of patients being treated (AlMarzooq, 2020). Triage has an essential role in prehospital services because in hospital services it does not have the same facilities or resources as intra-hospital. This makes it very important for ambulance nurses to understand triage. Work experience and training history of nurses have a relationship with nurses' triage knowledge (Duko et al., 2019). Knowledge of triage is also said to be complex and multifactorial and can also depend on several variables including gender, age, last education level, long working history, and individual factors owned by nurses (Widyani et al., 2020).

Nurse's knowledge regarding the analysis of the patient's situation and condition is needed because the patient's condition is different. Prehospital patients have varying degrees of urgency. In addition, the resources owned by ambulance nurses are limited, so the ability to extract information about the patient's situation and condition is needed. Knowledge of patient situation analysis is also needed because not all patients understand emergency conditions that do require ambulance handling. Hoikka et al. (2017) said that there were still many patients who after being provided with ambulance services did not require referral or further action, because they were not in an emergency condition. Therefore, prehospital ambulance nurses must be able to distinguish patients who are in a condition requiring immediate help through a good situation analysis.

2.   Attitude

The results of the literature review found that the attitudes of nurses that shape the competence of nurses in providing services include decision making, communication, collaboration, caring, ethics, and culture. The attitude of the ambulance nurse is understood as a term that expresses evaluative statements towards emergency patients who require ambulance services.

Decision making is the ability of the ambulance nurse in deciding the conditions and actions required by the patient. Decision making is defined as a continuous process and experience is one of the main factors in determining decision-making ability (Maharmeh et al., 2016). Ambulance nurses who are always dealing with emergency conditions should have a good attitude in determining the right decision making regarding the actions given according to the patient's condition.

Communication is the process of sending and receiving messages between two or more people with the aim of understanding the message conveyed. Communication that occurs in prehospital ambulance services can occur between nurses and patients, nurses with work partners or nurses with other communities. Communication has an essential role because with good communication optimal results in providing nursing care can be achieved (Yulviana, 2020). A good communication attitude is also needed when we operate on patient conditions by ambulance nurses to officers at hospitals or advanced health services. The lack of structured communication procedures and the dual meaning of responsibility to patients in patient operations can jeopardize patient safety (Dúason et al., 2021). In addition, the existence of language barriers is also an obstacle found in communication attitudes. Differences in the language used by patients with the official language used can be a social risk factor in decision making (Gerchow et al., 2021).

Collaboration in providing prehospital emergency services can be done by nurses with other professions such as doctors or pharmacists. Willingness and ability to collaborate is needed to be able to provide optimal service for patients. Collaboration with pharmacists can be in the form of governance of drug formulation, dosage, storage and compliance with the use of drug content regulated by legislation (Acquisto et al., 2020). The attitude of collaboration between nurses and doctors or other professions should be improved as much as possible. The existence of inter-professional education and teamwork can be used as a way to increase this collaboration (Suryanto et al., 2016).

Caring attitude is the basic essence of nursing care services. It is very important for nurses to have a caring attitude because patients or families who are in an emergency condition have higher emotions than ordinary patients. Therefore, a caring attitude towards patients and families is needed to know the unique needs of patients (Svensson et al., 2019). Satisfaction is also expressed by patients when receiving health services by nurses who show a caring attitude, explain the results of the examination, and provide health education (Kumboyono et al., 2018). This shows that patients will feel more valued and feel that nurses are indeed there to provide services to patients. Therefor it is very important to have a caring attitude in providing prehospital ambulance services.

Ethics and culture have a role in how ambulance nurses behave in paying attention to patient culture and how to provide actions or services that are in accordance with the code of ethics. Violations that become ethical dilemmas found in providing emergency services by ambulance nurses include nurses not maintaining the confidentiality of patient identities, and unpleasant treatment if there is a gap between the nurse's wishes and the patient's request (Abelsson & Lindwall, 2018). In addition, nurses may have maximized umama in providing services by always paying attention to ethics. Nurses in providing services cannot be separated from dealing directly with patients' ethical problems. So it is very important for prehospital ambulance nurses to know how to make decisions so that the moral rights of patients feel respected (Torabi et al., 2020).

3. Skills

The results of the study show that the clinical skills possessed by prehospital ambulance nurses are basic life support (cardiopulmonary resuscitation, airway management and ventilation), intubation, vital sign examination, physical examination, supporting examinations (ECG, laboratory, ultrasound) and management drugs. Ambulance nurse skills refer to the skills possessed by ambulance nurses in providing emergency services. Basic Life Support (BLS) is defined as the efforts made by ambulance officers to maintain the life of patients who experience life-threatening conditions. These conditions include immediate recognition of signs of cardiac arrest, immediate activation of the emergency response, immediate CPR, and immediate defibrillation with Automated External Defibrillation (AED) (Yayasan Ambulans

Gawat Darurat 118, 2020). BLS skills are the basis of every health worker and of course ambulance nurses have a vital role in conducting BLS (Hansda et al., 2020). In BLS there are several actions that can be taken including Cardiopulmonary Resuscitation (CPR), airway management and providing ventilation or breathing assistance.

CPR is the most important part of BLS to restore circulatory and respiratory function in patients experiencing cardiac and respiratory arrest. The success of CPR to restore circulatory and respiratory function depends on how quickly CPR is initiated upon finding a patient in cardiac arrest (Rikhotso et al., 2021). Regular education and training on CPR and certification based on the American Heart Association is needed to improve their ability to save the lives of patients experiencing cardiac arrest (Alnutaifi, 2021).

Airway management is an action taken by ambulance nurses in freeing the airway of patients who have partial or total obstruction. Prehospital airway management can be performed by people with varying levels of training and skills. Basic airway management can be carried out by a layperson who has received training and further moderate and advanced airway management can be carried out by trained ambulance personnel (Tawfik et al., 2021). Meanwhile, intubation is an advanced airway management by inserting an airway tube into the patient endotracheal. Intubation should be performed by personnel who have been trained and have clinical authority to perform the procedure. After the airway is declared patent, the ambulance nurse must then be able to ensure that the patient's breathing can meet the patient's oxygen needs.

In addition to core skills in carrying out life-saving actions, ambulance nurses must also be able to perform a comprehensive vital sign examination and physical examination. Vital sign checks that are often carried out by ambulance nurses include checking the patient's blood pressure, pulse, temperature, respiratory rate and peripheral oxygen saturation. While the physical examination that must be done must focus on the patient's problem or trauma that the patient has. This is done because the nurse must take action as soon as possible after meeting the patient. Therefore, an examination that focuses on the patient's health problem is needed.

The results of the study showed that the supporting examinations were carried out including ECG, laboratory and prehospital point of care ultrasound examinations. ECG examination is performed in patients who have complaints of chest pain (Wibring et al., 2021). Emergency nurses and nurses who work in ambulances as the front line of health care providers should be able to install and interpret ECGs. The active involvement of nurses in interpreting the ECG and continuous learning is needed to be able to develop and improve the competence of nurses in interpreting ECG. Interpretation of the results of laboratory tests is also needed to establish a proper diagnosis so that it can provide accurate action.

Prehospital Point of Care Ultrasound (POCUS) can be performed in providing ambulance services to patients with trauma, breathing difficulties, and in cardiac arrest. With the POCUS prehospital examination, nurses can find out if there is trauma or injury in the patient's body that is not visible through a physical examination (Bøtker et al., 2018). Diagnostic accuracy is highly dependent on the training and experience of the operator performing the examination. Procurement and training are needed to increase the probability of using POCUS in prehospital settings (Ketelaars et al., 2018). Thus, ambulance nurses can immediately provide focused action to overcome patient problems.

In addition to skills in carrying out supporting examinations, ambulance nurses must also understand drug management. Ambulance nurses who are usually on duty without a doctor, must be able to provide emergency medicine to save the patient's life. This requires that every ambulance nurse must understand the calculation of drug doses and the use of each emergency drug.

4.   CONCLUSION

Nurses who work in prehospital ambulances should have the competence to be able to save patient's lives. Nurse competence is formed from the knowledge, attitudes and skills of nurses. Knowledge that must be possessed by ambulance nurses includes assessment, triage, and situation analysis. The positive attitudes of ambulance nurses include decision making, communication, collaboration, caring, ethics and culture. The skills possessed by ambulance nurses are BLS, intubation, examination of vital signs, interpretation of supporting examinations and drug management. Ambulance nurses can improve emergency care competencies through continuous education and training.

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