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RESEARCH ARTICLE

Challenges and Barriers of Triage during Coronavirus Pandemic from the Emergency Nurses' Perspective: A Qualitative Study

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Abstract:

Introduction:

Triage of patients is vital for taking the optimum therapeutic measures during an epidemic of infectious diseases. The aim of this study was to determine the challenges and barriers to triage during the coronavirus epidemic from the nurses' perspective.

Methods:

This study was conducted using a qualitative content analysis method in 2020 in the North of Iran. Fifteen triage nurses were selected through the purposive sampling method, and data were collected through semi-structured interviews.

Results:

Following data analysis, two main themes, four categories, and 14 subcategories emerged. The main theme, 'defective triage,' included two categories of 'inability to implement standard triage, and 'the lack of efficient planning', and the theme 'alone in crisis' included two categories: 'triage personnel's heavy workload', and 'insufficient support for triage personnel'.

Conclusion:

The results of this study point to the challenges of planning and effective implementation of triage during the COVID-19 epidemic from the point of view of nurses, and it seems very important and necessary to pay attention to these challenges, control and manage them during the epidemic, as well as plan to prevent their occurrence.

Keywords: Triage, Epidemic, COVID-19, Nurse, Content analysis, Infectious diseases.

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1. INTRODUCTION

COVID-19 disease, also known as acute respiratory syndrome COVID-19, has recently become an epidemic worldwide. This infectious disease, caused by the novel coronavirus, was first identified in Wuhan, China, and reported for the first time in Iran on February 20th, 2020 [1]. In pandemics and crises, the preparation of health care providers, especially emergency and critical care nurses, to manage increased infectious disease outcomes is essential [2 - 4].

Triage is a process of prioritizing patients based on the acuity of the problem in order to provide the optimal treatment in the shortest possible time, which is the basis of visits and other services in the emergency department [5, 6]. The word 'triage' is derived from the word 'trier,' which means to sort [7 - 9]. Depending on the circumstances, this concept is used in unexpected events, such as epidemics and crises and, in routine circumstances, hospital emergencies [9, 10]. The history of this system in hospitals dates back to the early 1960s in US hospitals [11 - 13]. Accurate information is lacking about the history of triage implementation in a current manner in Iran. However, it seems that with the development of emergency medicine in the country around 2000, the issue of in-hospital triage was accentuated, and the implementation guidelines and principles of setting up a hospital triage system in emergency departments were communicated to all hospitals by Iran's Ministry of Health and Medical Education in the spring of 2011 [6]. Due to the overcrowding in the emergency department, there is a need to prioritize patients. This method, particularly in epidemics, is the most practical action in the emergency department to reduce the way patients are ignored

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and care for critically ill patients [9]. The ESI triage is a five-level triage method in which patients are categorized based on two criteria of disease acuity and resources required for the patient; the former is characterized by the presence or absence of life-threatening factors and organs, high-risk situations, and vital signs, the latter is determined based on the nurse's experience and comparing the current patient with similar cases. In this method, the triage nurse first evaluates the patient based on the acuity of the disease and the patient's condition. In less-acute cases, *i.e.*, in the absence of life/organ-threatening conditions or high-risk situations (triage levels 1 and 2), the nurse categorizes the patient based on previous experiences of other patients and triage system training while estimating the resources needed for the patient in the emergency department. Therefore, the triage nurse, in addition to being fully informed about the algorithm, is required to have sufficient experience [14, 15].

However, to be implemented, this system requires a set of elements, including sufficient space, required resources and equipment, a communication system, and an accessible treatment area supported by an experienced professional team. In the meantime, it seems that the role of an individual implementing triage, *i.e.*, the triage nurse, is of particular importance, and in the case of emerging epidemics, the way to deal with patients with confirmed and suspected diseases can be a potential factor in causing a disaster. As the accuracy, correctness, and correct time of decision-making by the triage nurse have a direct effect on the emergency department's performance, identifying opportunities and challenges for effective triage and promoting its quality in epidemics of emerging diseases is crucial [15].

Various studies indicate diverse complications in medical centers regarding effective triage, such as a lack of proper implementation strategies and activities related to training, maintaining change, motivation, creating consensus, and organizing information [16], lack of necessary training on triage for nurses and understanding their responsibilities in this unit [15], communication problems and lack of resources and equipment, as well as recruiting inexperienced staff in the triage unit and the lack of a triage nurse in the emergency department [9]. In studies conducted in Iran, challenges, such as low skills and speed of nurses during triage [17], have been mentioned. Furthermore, clinical incompetence and management inability in emergencies are recognized as challenges for Iranian triage nurses [18].

In the emergency department, to have a successful triage, especially in times of crisis, it is vital to benefit from a clear and appropriate practical pattern and operational instructions. In order to achieve optimal results, investigating the current problems and obstacles and gaining accurate insight to solve probable complications may help improve the performance and quality of triage in facilities and hospitals [9].

Given the complex nature of the challenges facing triage and the impact of epidemics on its implementation, there is an urgent need to recognize its dimensions in the group providing this process, namely nurses. Examining these perspectives and discovering the challenges of triage implementation during an outbreak of emerging coronavirus disease may be used as a practical guide to resolving the problems of the hospital triage system during epidemics and a reliable solution for managers to establish a hospital triage system in epidemics. On this path, nurses working in emergency departments are among groups whose information and experiences can be used to explain the challenges. This group of medical staff can be the foremost source of information due to their presence on hospital front lines. Nurses are able to provide information that, if properly evaluated, can improve the triage process. Therefore, considering the importance of triage and its impact on social, cultural, and organizational conditions and the lack of sufficient resources and research in this regard, as well as the existence of a research gap, the researcher aimed to explain the challenges and obstacles to triage during the COVID-19 pandemic from nurses' perspective using content analysis method.

2. METHODS

2.1. Study Design

This study is a conventional qualitative content analysis that examines the challenges of triage during the coronavirus pandemic from the perspective of nurses working in the emergency department and triage unit of hospitals involved during this disease. Qualitative studies are among the most appropriate types of studies to discover behaviors, feelings, attitudes, characteristics, values, meanings, and perceptions determining particular individuals or groups' health status and lifestyle [14, 19]. Since there is no sufficient and complete knowledge about the challenges and obstacles to triage from the nurses' perspective during the coronavirus pandemic, this study was conducted to explain nurses' experiences during the triage of patients with COVID-19.

2.2. Participants

The study population consisted of nurses working in medical centers and hospitals in the north of Iran. After obtaining the code of ethics and written informed consent from the nurses, sampling was done. Totally, 15 triage nurses with at least two years of work experience (attending the triage unit during the coronavirus pandemic) were purposefully included in the study, if desired, and shared their experiences using semi-structured interviews until the data were saturated, and the previous data was repeated.

2.3. Data Collection

While introducing herself and providing a brief description of the study objectives, the researcher invited the samples to participate in the study. As the main question, the participants were asked: "Please describe the experience of one working day in your triage unit during the coronavirus pandemic." Afterward, the interview process was guided to cover its objectives with questions, such as: "What measures do you take when a patient enters a triage unit during an epidemic?" What are the barriers to proper triage during the coronavirus pandemic? What helps you to do better triage? What are the challenges of the triage unit? What do you think are the factors influencing the quality of triage? Exploratory questions, such as: "Can you explain it more? and "Did I get you right?" were

used. The duration of interviews ranged from a minimum of 30 to a maximum of 60 minutes, based on access to appropriate data. Data collection continued until data saturation was reached. The interview texts were transcribed verbatim immediately after each interview, and field notes and reminders were written to help analyze the data in each interview.

2.4. Data Analysis

After transcribing all interviews, their text was read several times in order to achieve the general feeling of different aspects of the experience. According to the proposed steps of Graneheim and Lundman, 2004 [20], the findings were presented as codes, categories, and subcategories. The analysis steps included 1 - The content of the recorded interviews was transcribed and read several times by the researchers to gain a general and accurate understanding. 2- All interviews and observations were considered as a unit of analysis. 3- words, sentences, or paragraphs were considered as meaning units. 4- Afterward, the meaning units reached the level of abstraction according to their implicit concept and were labeled with codes. 5- Codes were compared with each other in terms of similarities and differences and categorized under more abstract categories with a specific label. 6- In the end, by comparing the categories and deep and accurate reflection, the content hidden in the data was introduced under the title of the study theme. In this way, the main themes, including the challenges and obstacles to triage, were extracted from the hidden content of the interviews and organized. Moreover, the analysis process was continuously performed in accordance with the mentioned steps, from meaning units and codes to subcategories, categories, and themes and vice versa.

2.5. Trustworthiness

In this study, Lincoln and Goba's four criteria, including credibility, transferability, dependability, and confirmability [21], were used to evaluate the validity of the findings. To establish credibility (reliability of the data), the researcher used maximum diversity sampling and adequate data collection (in-depth individual interviews and focus group discussion), selected appropriate meaning units, elaborated on the formation of categories and themes, quoted participants to identify differences between categories, allocated sufficient time to data collection, observed prolonged and reciprocal engagement with data, used member check and peer debriefing/peer review methods, and observed coding interviews simultaneously by two researchers and external audit. In order to reduce the likelihood of data instability and increase data reliability, the researcher attempted to ask all participants questions in similar areas and use the interview guide. The audit trail was also used to ensure dependability. In other words, all research steps, decisions, documents, and results were reviewed by an external observer. In order to identify the transferability of the data, the steps of the study and the activities performed in this path were written precisely with a clear and purposeful description so that other individuals in different settings could conduct this research. In order to ensure confirmability, the researchers tried to prevent their assumptions from interfering with data collection and analysis as much as possible. In addition, the audit trail, already described, also helped to establish research confirmability.

3. RESULTS

In the present study, the participants' age ranged between 26 and 45 years, and their mean age was 35.5 years. In total, two men and 11 women with a bachelor's degree (13 individuals) and a master's degree (2 individuals) with an average work experience of 10 years (2-20 years) participated in the study. Analysis of the findings from the interviews led to the extraction of two main themes (alone in crisis and defective triage), four categories, and fourteen subcategories (Table **1**).

Table 1. Extracted codes, subcategories, categories and themes.

Initial Codes	Subcategories	Categories	Themes
No window in the triage room - small triage room - unavailable laboratory and radiology units next to the triage	Failure to comply with environmental standards	Inability to implement standard triage	Defective triage
Lack of sufficient workforce in the triage unit - COVID and non-COVID triage implemented by the same nurse - no secretary in the triage unit	Failure to comply with human resources standards		
Lack of personal protective equipment - Lack of sufficient facilities in the triage room - equipment shared between COVID and non-COVID patients	Failure to comply with equipment standards		
Not considering a separate triage room for COVID and non-COVID patients - patients being put together	Lack of ward separation	Lack of efficient planning	
Absence of physicians from the workplace- nurses' loneliness in the workplace - absence	Officials' ineffective presence in the crisis		
Changing top managers - no utilization of the experience of doctors involved - no utilization of triage nurses' experiences	Failure to utilize experiences		

(Table 1) contd.....

Initial Codes	Subcategories	Categories	Themes
Long working hours, heavy workload, the disproportionate number of patients and nurses – colleagues' frequent sick leave	Abandoning work	Triage personnel's heavy workload	Alone in crisis
Nurses' fear of getting infected - fear of being a carrier - fear of the family getting infected	Fear		
Fatigue – lack of concentration in work - conflicts	Physical and psychological effects		
Lack of a plan to recruit volunteers - disregard for labor law requirements for staff	Lack of job security	Insufficient support for triage personnel	
Lack of security guard in the triage unit - lack of danger warning system in the triage unit – personnel's loneliness in the triage unit	Insecurity of the triage environment		
Lack of financial incentives for nurses - Lack of spiritual motive for nurses	Lack of a motivating system		
Nurses' triage unaccepted by doctors - Doctor's visit before triage implementation by the nurse - entering incorrect codes by the doctor	Improper communication between the nurse and the doctor		
Ignorance of nurses' recommendations on triage - ignorance of triage unit nurses' experiences	Inefficient interaction between nurses and managers		

3.1. Defective Triage

This theme consisted of two categories: 'inability to implement standard triage' and 'lack of efficient planning.'

The majority of the participants stated that one challenge concerning triage was the inability to implement the standard triage in times of crisis due to inattention to the triage structure and the allocation of appropriate space and facilities for it.

Participant No. 3 stated that "*Our triage room does not have windows, and at first, we triaged both COVID and non-COVID patients in this room. After a while, they said that acute respiratory triage, which is performed in a room near triage in our hospital, should be separated from hospital triage. But they did not allocate any workforce for it. I mean, the triage staff should cover both rooms, but it is impossible. The number of patients has increased compared to the past, and people are not patient enough to wait for the triage of a patient to end, and they enter the room without permission. If the patient is in critical condition, they cannot wait until I do the acute respiratory triage, then come to this room and perform the normal triage. We are confused between two rooms*."

Another challenge for nurses was the lack of efficient triage planning, failure to use experiences, and individual decision-making during the COVID-19 crisis. COVID and non-COVID patients were present in the ward together while implementing triage, and low interdisciplinary collaboration was observed in the allocation of units, which all indicated the lack of planning in the COVID-19 crisis context.

Participant No. 5 stated that "*We did not and do not use experiences. Now, in our hospitals. I told the doctor that was visiting from the ministry, and he confirmed me and told the director of the hospital; the matron said: "Yes, you are right, and COVID and non-COVID triage, and also poisoning emergency department, must be separated." But it did not happen. So why did it not happen when the hospital had two doors on the clinic side and two large doors on the yard's side? They say that they have their own problems, and the doctors say that they have their own, and other doctors do not cooperate with them and do not provide them with their own wards. But it is only justifying, and there is no reason for it. When the hospital is in need, the university and the ministry are in need, I should not claim that this is my bed, or that is my bed, and it is my ward, or do not close down my ward*."

Participant No. 7 stated that "*Those days, the nurses' presence was very significant. There were a few medical professors who held executive positions, such as hospital chairman or manager. Well, ward heads were present, but you would rarely see some doctors in the hospital during March and April. There were sick people then, but half of the attendants were not present, or the residents had abandoned their work because of insufficient protection and silent carriers*."

3.2. Alone in Crisis

This theme consisted of two categories: 'triage personnel's heavy workload' and 'insufficient support for triage personnel.'

One of the nurses' main problems during the COVID-19 crisis was their high workload. Countless referrals, cancellation of leaves and off days, abandoning work, and infection and death of some staff members increased the staff's workload and fatigue.

Participant No. 1 stated that "*The first days, there was fear and stress in all medical staff, such as medical students and nurses, and we have to admit that most of the staff left work and many said that kindergartens and schools were closed and there was no one to take care of their child. Somebody said her family was her priority, and they abandoned work. The workload was too heavy*."

Nurses' other problem was the inadequate support for triage personnel, which had led to their indifference and dissatisfaction during the COVID-19 crisis. In this regard, participant No. 6 stated: "*There were several motives, for example, financial incentives, that they could provide for staff like me who have put their life on the line. A number of my co-workers died, and they had not received overtime pay and incentives. But everyone told us sarcastically; many times, they said that they had given the budget to the university. When they want to pay, they say it is not enough; if it is so, why is it reflected differently in the media? If payments and overtime pays are a little up-to-date, it certainly motivates them more. For example, the staff says: "If I die, who will benefit from the COVID-19 rights?"*

4. DISCUSSION

Given the prominence of triage in crises, implementing standard triage and providing quality services in this area is of particular importance and vital. In order to achieve optimal results in triage, investigating the problems and obstacles may help to gain the correct insight and alleviate the challenges. Although several studies have been carried out on triage and the necessity to perform it in crises, few have discussed the challenges and obstacles to triage during the COVID-19 pandemic. The results of the present content analysis indicated that the main challenges and obstacles to triage during the COVID-19 pandemic appeared in two main themes: 'defective triage' and 'alone in crisis.' The 'defective triage' theme consisted of two categories: 'inability to implement standard triage' and 'lack of efficient planning,' and the theme 'alone in crisis' consisted of two categories: 'triage personnel's heavy workload' and 'insufficient support for triage personnel.'

Most nurses introduced the lack of efficient planning during the coronavirus disease crisis as a factor causing a challenge for the treatment team. Planning and preparing for the crisis during and prior to it is one of the fundamental pillars of effectively dealing with the crisis. According to the World Health Organization (WHO), preparedness is one of the practical factors in reducing the damage caused by crises [22]. In the present study alike, it was revealed that managers' lack of awareness and insufficient attention to the crisis of emerging diseases as well as the establishment of triage units in temporary locations without proper planning and comprehensive view of the subsequent issues using systems that partially, not thoroughly, solve problems, had led to fundamental complications in the triage system during COVID-19 crisis. In this regard, Bijani (2019) pointed to the structural and functional challenges in triage from the nurses' perspective as management challenges. The results of this study were consistent with the present study, which, in fact, refers to non-compliance with environmental, staffing, and equipment standards in the category of 'inability to implement standard triage' and 'failure to separate wards,' 'officials' absence during the crisis,' and 'failure to utilize experiences' in the category of 'lack of efficient planning,' indicate the structural and managerial challenges [18]. Likewise, their study highlighted the importance of proper and rapid management of infectious diseases in triage to timely identify patients with infectious diseases and their immediate isolation and proper control of conditions to prevent transmission to other patients and those who were referred to medical centers, in an effective triage [23]. The theme 'alone in crisis' refers to the high workload of triage personnel and insufficient support for them. Most nurses had a negative view of crises; in fact, they felt alone in crises. Numerous nurses mentioned heavy workloads, high stress resulting from the countless deaths of patients and the loss of colleagues, dealing with their fears and fears of family troubles, colleagues abandoning work, and the absence of most managers during the crisis as the symbols of their loneliness. This is while, in the post-crisis phase, many people who refused to attend the hospital during the crisis returned to work. The remarkable thing is that we always see high traffic of nurses in the emergency room, but during the Corona crisis, this work pressure increased many times, which caused the nurses to feel more lonely than in normal conditions. In the results of the study by Bijani (2019), which are in line with the present study, nurses referred to job abandonment, fear, physical and psychological effects related to a high workload of triage personnel, lack of job security, lack of incentive system, improper communication and cooperation between nurses and physicians, weak interaction between nurses and managers, and inadequate support for the personnel as triage challenges [18]. All these issues become more accentuated and unbearable in times of crisis. Various factors may help nursing staff reduce this burden. Janssen *et al.*, in their study on influential factors in triage in the emergency department, stated that various factors at the individual, social and organizational levels, such as motivation and commitment, physicians' awareness, workload, access to resources, support of managers, and the cooperation of nurses and physicians are effective factors in triage. Consequently, more effective triage can be planned and implemented by developing appropriate strategies, raising awareness, paying attention to changes, and establishing motivation, consensus, and cooperation. In the above-mentioned study, nurses primarily pointed to the lack of resources and cooperation between groups and managers and physician shortages [16]. The results of this study are consistent with the present study results, which point to nurses' high workload and insufficient support for them during triage as the challenges of most nurses in the triage unit, paying attention to which is of great importance to increase the triage quality.

Various studies in this field indicate several challenges in medical centers regarding effective triage. Deficiencies in the necessary nurse training on triage and elucidating their responsibilities in this unit [15], communication problems, lack of resources and equipment, recruiting inexperienced personnel in the triage unit, as well as the failure to allocate the nurse in charge of triage in the emergency department [9], were among the challenges introduced in these studies. In this regard, training proper triage and alleviating barriers to its effective implementation [24], as well as controlling environmental barriers, such as employees' stressful working conditions, lack of resources, awareness/knowledge, empowering physicians about disease risk factors and increasing their skills in triaging specific diseases have been reported in these studies [25]. The results of these studies are in line with the present study results, which refer to the planning and implementation of standard triage and alleviation of barriers to the triage personnel's action as effective factors for the implementation of a standard and non-challenging triage.

CONCLUSION

Triage is of particular importance during epidemics and biological crises. The results of this study point to the challenges of effective triage planning and implementation and the nursing staff's loneliness during triage in the crisis from their perspective in the recent COVID-19 pandemic. Therefore, paying attention to these challenges, their control, and management during epidemics, as well as planning to prevent the occurrence of these problems, seems important and necessary.

AUTHOR'S CONTRIBUTION

M KH contributed to conceptualization, project administration, supervision, methodology, and original draft. M A participated in writing, reviewing, editing, formal analysis, and original draft: M JSN contributed to methodology, data curation, and validation. M A contributed to conceptualization, data curation, supervision, reviewing, and editing.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The present study was approved by the Ethics Committee of the Guilan University of Medical Sciences by the code IR.GUMS.REC.1399.119 and was supported by the Guilan University of Medical Sciences.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants of this study.

AVAILABILITY OF DATA AND MATERIALS

The authors confirm that data supporting the findings of this study are available in the article.

STANDARDS OF REPORTING

COREQ guidelines were followed.

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None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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