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PATIENTS' AWARENESS OF TRIAGE IN EMERGENCY DEPARTMENTS OF JEDDAH FIRST HEALTH CLUSTER HOSPITALS

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ABSTRACT

An essential aspect of every emergency room's workflow, triage ranks patients in order of severity of illness. Patients must be informed of triage to minimize confusion, irritation, and discontentment as they wait for treatment. The study aimed to assess Patients' Awareness of Triage in the emergency departments of Jeddah First Health Cluster hospitals. A cross-sectional descriptive design was employed, targeting medically stable adult patients (≥18 years) who visited EDs and consented to participate. Data were collected using a structured, self-administered online questionnaire and supplemented by verbal discussions with participants. A convenience sampling technique was applied, yielding a final sample of 300 patients. Data were analyzed using SPSS version 27, applying descriptive and inferential statistics, including multiple regression analysis. Of the participants, 52% were females, 28% were above 55 years, and 39% were postgraduates, with most (87%) holding Saudi nationality. The majority (80.3%) had visited the ED in the past six months, 54.3% because they were too sick to go elsewhere. About 65% were interested in information about triage, and 54% found verbal explanation by staff most helpful. Overall, 55% demonstrated high awareness of triage, 39% moderate, and 16% low. Regression analysis showed age and education were significant predictors of awareness ($p < 0.05$). The study found that over half of the participants possessed a high level of awareness of triage procedures, with age and education being identified as significant predictors. These results emphasize the necessity of focused educational initiatives to improve patients' comprehension of triage in emergency departments.

Keywords: Awareness, Education, Emergency Department, Patients, Predictors, Triage

1. INTRODUCTION

The Emergency Department (ED) is a lifeline that guarantees critical, round-the-clock care for people suffering from acute conditions, ranging from heart attacks to minor injuries. It employs advanced instruments and uses the skills of different teams to either manage the situation or direct the patients to the right service.[1] The ED is a vital part of the healthcare system, being at the forefront of the fight against the pandemic, and thus, assuring the administration of timely therapies.[2] The demand for ED is very high all over the world. About 20-30% of hospital admissions come from ED visits in high-income countries.[3] There were 145 million ED visits in the U.S. in 2021, out of which 13% resulted in admissions. This has led to overcrowding and the overuse of resources, especially in urban areas. The situation in Saudi Arabia is not very different, as the emergency department is getting overwhelmed with non-urgent cases, which have been found to make up 75 % of the ED visits.[4]

Triage sorts patients through the severity of conditions, which means the most critical cases as trauma, are on the spot. Through risk class systems, such as the Emergency Severity Index, triage makes resource use and the output better; however, it encounters problems like a large number of patients and a lack of staff training.[6,7] Without sufficient understanding of triage, patients will experience dissatisfaction since they often expect that the care will be provided immediately in any case.[8] Research has shown that only 30-40% of emergency department (ED) patients are aware of triage, and they mistakenly believe that the principle of first-come, first-served is applied.[9] A survey in Saudi Arabia revealed that 60% of citizens are aware of triage, but 35% still anticipate treatment within five minutes.[10] In a research project conducted in the Eastern Province of Saudi Arabia, out of 775 participants, 73.8% acknowledged prioritization, 80.5% considered it fair, and 64.8% understood triage.[11] Moreover, frequent ED visitors and younger, educated patients were found to have a higher level of awareness. The main reasons for non-urgent visits to ED were the lack of primary care (35%) and the belief that the ED would provide faster care (30.4%).

Patients' education about triage has been found to increase their satisfaction by 18% and reduce the number of complaints about waiting times by 22%.[12] Informed patients in the Netherlands were found to accept waiting times 15% more and to trust the staff 12% more.[13] Signage or apps can be used as instruments to lower patients' anxiety and to gain their loyalty.[14] The study of triage knowledge in Saudi Arabia is really important, considering the number of non-urgent visits to emergency departments and the fact that the culture expects immediate treatment.[4] The absence of a common triage system highlights the need for specific education to match patients' expectations with clinical priorities.

The research strongly supports Saudi Arabia's Vision 2030 by evaluating the knowledge of triage in the emergency departments of Jeddah First Health Cluster hospitals, thus making it possible to discover the gaps in knowledge and factors that may affect such knowledge, for example, demographics. [15] More possible awareness can lower the number of non-urgent visits and increase the efficiency of the emergency department. The lack of data on the awareness of triage in Saudi Arabia is the main obstacle to the provision of various interventions. This research will contribute to the preparation of educational materials that reflect the culture and the region, thus optimizing the utilization of the emergency department and gaining patient trust. Better triage awareness can increase the trust between patients and healthcare providers and also lessen the load on the emergency department. If patients are given clear communication about prioritization, this can reduce the feeling of dissatisfaction and, at the same time, make the healthcare system more efficient.[16]

2. METHODOLOGY

The study aimed to assess Patients' Awareness of Triage in the emergency departments of Jeddah First Health Cluster hospitals.

2.1. Study Design

A cross-sectional descriptive study design was employed to achieve the aim of the current research. This design is appropriate as it enables data collection from a large number of patients at a specific point in time, thereby allowing efficient identification of patterns and associations between patients' awareness of triage and influencing factors.

2.2. Study Setting

The study was carried out in emergency departments of Jeddah First Health Cluster hospitals, which are part of the Ministry of Health's healthcare transformation initiative in Saudi Arabia's reform plan, and it contains many large public hospitals that offer emergency treatment to a varied patient population throughout the Jeddah region. These hospitals serve as referral hubs and have modern resources to address both urgent and non-urgent situations, making them ideal for investigating

patient triage awareness. The unique demographic profile of hospital visitors, including differences in age, gender, socioeconomic level, and educational background, provided an opportunity to record a wide range of viewpoints on triage.

2.3. Study Population and Inclusion Criteria

The study population included all adult patients visiting emergency departments of Jeddah First Health Cluster hospitals, which are part of the Ministry of Health's healthcare transformation initiative in Saudi Arabia. Participants were required to meet the following inclusion criteria:

- Patients aged 18 years and above
- Medically stable patients
- Patients can provide informed consent

2.4. Exclusion Criteria

Participants were excluded if they were:

- Experiencing cognitive impairments or communication difficulties
- Patients who were non-Arabic speakers

2.5. Study Period

Over a period of three months, the investigation was carried out.

2.6. Sample Size

The sample size was calculated using Epi-Info and online sample size calculators, considering:

- Confidence level: 95%
- Margin of error: 5%
- Power analysis: 80%
- Degree of precision: 80%

The calculated sample size was 300 patients.

2.7. Sampling Technique

A convenience sampling method was employed to recruit participants during their visits to emergency departments of Jeddah First Health Cluster hospitals, which are part of the Ministry of Health's healthcare transformation initiative in Saudi Arabia. The availability and willingness of patients were taken into account while inviting them to participate. In the fast-paced emergency room, where patient flow is unpredictable and time is of the essence, this method was selected for its practicality. In order to ensure that the study included enough participants within the allotted period, researchers utilized convenience sampling to properly collect data. But not all patients had an equal opportunity to be recruited; therefore, there is a possibility of selection bias and lower generalizability with this strategy. To mitigate this bias, we made an effort to invite patients at various times and on different days of the week, broadening the sample's demographics.

2.8. Pilot Study

An initial study with 31 patients (about 10% of the total sample) was performed to check out the practicality, understanding, and opinion of the users concerning the tools used for data collection. The pilot was conducted in one hospital within the emergency departments of Jeddah First Health Cluster hospitals using a Google Forms questionnaire distributed via WhatsApp, X, and Facebook. Feedback obtained was used to refine wording and improve the user experience. Pilot participants were excluded from the final analysis.

2.9. Data Collection Tools

Data were collected using a structured, self-administered online questionnaire consisting of three tools:

- **Tool I: Demographic Information** (age, gender, educational background, nationality, frequency of emergency visits).
- **Tool II: Patient Experience of Triage** (developed by the researcher based on.[17,18] Questions assessed ED visits, causes of visits, awareness of triage, understanding of patient prioritization, and interest in receiving information.
- **Tool III: Patients' Awareness of the Triage System** (adapted from[19], translated by.[17] It contained 8 close-ended items assessing knowledge and perceptions of triage practices.

Scoring System: The eight awareness questions were scored 0–8. Higher scores indicated greater awareness. Awareness levels were classified as low (<50%), moderate (50–75%), or high (>75%).

2.10. Data Collection Procedure

The data collection tool was Monkey Survey. Triage workers provided patients who were eligible with a QR code or WhatsApp link to access the survey, which they filled out on their devices. In addition, some participants were interviewed directly to complete the questionnaire. The responses were recorded on the spot, and participants were encouraged to finalize any incomplete surveys. The data collection process was continuous for three months. In order to ensure the accuracy of the data, contributions that were identical were considered and removed, and only those responses that were fully completed were taken into account in the final analysis. The survey was available in both Arabic and English to accommodate the participants' language preferences, and, in order to

reduce the possibility of misunderstanding, a short guide was given at the beginning of the survey. Besides that, confidentiality and anonymity were assured as no personal identifiers were requested and participants were informed of the voluntary nature of their participation prior to completing the survey. These measures enhanced both the response rate and the quality of the collected data.

2.11. Validity and Reliability

Content validity was ensured by adapting previously validated questionnaires.[17,19] Emergency medicine experts reviewed the tools for relevance, clarity, and cultural appropriateness. The Arabic translation was verified by bilingual healthcare professionals. Reliability was tested using Cronbach's alpha, with coefficients above 0.7 confirming acceptable internal consistency.

2.12. Data Analysis

The data were exported from Google Forms to SPSS version 27 for the purposes of analysis. In order to provide a summary of demographic data, emergency department (ED) usage, and awareness scores, descriptive statistics, which include frequencies, percentages, means, and standard deviations, were utilized. In order to investigate the relationships between demographic characteristics and degrees of awareness, chi-square tests as well as other types of inferential statistics were utilized. A p-value of less than 0.05 was deemed to be statistically significant.

3. RESULTS

Table (1) Socio-demographic Characteristics of Study Participants (n=300)

Socio-demographic Characteristics	Study (n=300)	
	N	%
Age		
18 – < 25 years	84	28
25 – < 35 years	37	12.3
35 – < 45 years	66	22
45 – < 55 years	75	25
≥ 55 years	**84**	**28**
Gender		
Male	144	48
Female	**156**	**52**
Education		
High School or Below	69	23
Colleague/University	114	38
Postgraduate	**117**	**39**
Nationality		
Saudi	**261**	**87**
Non Saudi	39	13

Table 1 shows that more than 28% of study participants were aged more than 55 years, 52 % of them were females, and 39 % were postgraduates. In addition, 87% of the study sample holds Saudi nationality.

Table (2) Patients' Experience of Triage in Emergency Departments (n=300)

Questions	Study (n=300)	
	N	%
Did you visit the ED in the last 6 months?		
Yes	**241**	**80.3**
No	59	19.7
Causes of visiting the ED?		
Too sick-need to go to the ED	**163**	**54.3**
It is regular to go to the ED for care	18	6
No appointments available at other healthcare centers	10	3.3
Need tests that other healthcare centers cannot do	8	2.7
Care is better in the ED	20	6.7
It is faster to see a doctor in the ED	21	7
Medical insurance coverage and eligibility for treatment	17	5.7
Other financial reasons	14	4.7
A doctor advised going to the ED directly	22	7.3
Close to where I live/work	7	2.3
Are you interested in getting information about the patient sorting process during your visit to the emergency department?		
Yes	195	**65**
No	105	35
What are the sources of information that you find extremely helpful in understanding the sorting process?		
Verbal explanation by staff	**162**	**54**
Pamphlets/brochures	45	15
Visual aids/videos	93	31

Table 2 reveals that 80.3% of studied patients had visited the emergency department in the last 6th months, 54.3% of them visited the triage because they were too sick to go to the ED. In addition, 65% of them were interested in getting information about the patient sorting process during their visit to the emergency department, and 54 % of them said that verbal explanation by staff was a helpful source of information for understanding the sorting process.

Table (3) Patient Awareness about the Triage System in the Emergency Department (n=300).

Patient Awareness	Study (n=300)	
	N	%
Do you know what triage means?		
Yes	**171**	**56.7**
No	129	43.3
Do you know why some patients are taken to a room before others, even though they may not have waited as long?		
Yes	**159**	**53**
No	141	47
Do you think this (what is in the previous question) is fair?		
Yes	**190**	**63.3**
No	110	36.7
Do you agree with the classification of patients based on the deterioration?		
Yes	**200**	**66.7**

No	80	33.3
Does the presence of the triage system in the hospital improve patient care?		
Yes	**225**	**75**
No	75	25
Do you think patients are referring to an appropriate place in the emergency room?		
Yes	**225**	**75**
No	75	25
Do you think the provided information at the ED about the triage process is adequate?		
Yes	**230**	**76.7**
No	70	23.3
Are you satisfied with the triage process at the ED?		
Yes	**185**	**61.7**
No	115	38.3

Table 3 reveals that 75% of the studied patients thought that the presence of the triage system in the hospital improved patient care, and the patients were referred to an appropriate place in the emergency room. Furthermore, 76.7% of the patients thought that the provided information at the ED about the triage process was adequate.

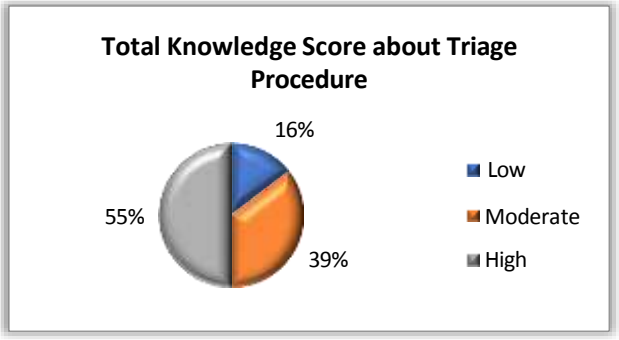

Figure (1): Patients' Awareness about the Triage System in the Emergency Department (n=300)

Figure 1 demonstrated that 55% of the study participants had high awareness about the triage system in the ED, and 39% of them had moderate awareness, with a small proportion 16% having lower awareness.

Table (4) Multiple Linear Regression Analysis of Factors Affecting Participants' Knowledge regarding Triage (n=300)

Model	B	Std. Error	Beta	t	P - value
(Constant)	0.360	0.095		3.77	0.001**
Age	0.073	0.016	0.303	4.55	0.001**
Gender	0.051	0.031	0.078	1.61	0.107
Education	0.119	0.027	0.283	4.36	0.001**
Nationality	0.073	0.048	0.076	1.53	0.127

Table 4 highlights the factors influencing participants' awareness regarding triage through a multiple linear regression analysis. Notably, age and education emerged as significant predictors, with positive coefficients indicating that older individuals and those with higher educational levels tend to possess greater awareness about the triage process.

4. DISCUSSION

The goal of the triage method was to determine the hazards associated with each patient by classifying them according to their severity. Therefore, patients or their loved ones may feel less dissatisfied with the department if they are informed about the role of the triage. 1 Patients' triage knowledge in Saudi Arabian emergency rooms (cluster 1) was the focus of this research.

As for socio-demographic characteristics, the study findings show that more than one quarter of the study participants were more than 55 years old, more than half of them were females, and more than one third of them were postgraduates. In addition, the majority of the study participants hold Saudi nationality. Similarly, [10] conducted a study was conducted to assess awareness of the triage system in emergency departments among the general public in Saudi Arabia, and they found that more than half of the study participants were females, held a bachelor's degree, and the majority of them held Saudi nationality.

Regarding patients' experience of triage in emergency departments, the study findings revealed that more than half of the studied patients visited the emergency at the last 6 months because they were too sick and needed to go to the ED, indicating that many individuals perceive the ED as a critical resource for urgent healthcare needs. In addition, nearly two-thirds of them were interested in getting information about the patient sorting process during their visit to the emergency department. This interest underscores the potential for educational initiatives aimed at improving patients' knowledge about triage, which could enhance their overall experience and satisfaction during their ED visits.

These findings come by.[11] They mentioned that more than half of their study participants had visited the ED in the last 6 months, and[20] reported that being too sick, so needed the ED, was the most common cause of visiting the emergency department in their study. In addition,[16] found that the majority of participants viewed the provision of information about the triage process in ED as important

The current study assessed the patients' level of awareness regarding triage procedure at the ED, and the findings reflected that slightly more than half of the study participants had a high level of triage awareness and more than one-third had moderate

awareness, and the lowest percentage had a low level of awareness. The researcher regarded the educational interventions provided by the hospital healthcare workers to enhance awareness and understanding of triage processes, ultimately improving patient experience and outcomes in emergency settings.

These findings align with previous research by[10], which similarly found that a substantial proportion of the public in Saudi Arabia possessed varying levels of awareness about the triage system in emergency departments. In contrast,[21] reported that many patients had limited knowledge about the triage system, with only a fraction demonstrating a comprehensive understanding of its purpose and function in emergency care. These differences in the previous findings highlight the ongoing need for initiatives aimed at increasing awareness of triage procedures among diverse patient populations.

The factors influencing participants' awareness regarding triage were examined through a multiple linear regression analysis. Notably, age and education emerged as significant predictors, with positive coefficients indicating that older individuals and those with higher educational levels tend to possess greater awareness about triage processes. [20] supported this result as they discovered that patients' awareness of the triage system was influenced by their level of education. Also, [10] found that patients' age influenced their level of awareness regarding the triage procedure.

Furthermore, a recent study in the Al-Ahsa region discovered that 59.4% of participants had heard of emergency triage, and 91.8% agreed with the notion of categorizing patients based on deterioration.[22] In comparison to the research, where slightly more than half showed high awareness, this indicates very equal levels of general awareness. However, in Al-Ahsa, 38.8% expected to wait 5-10 minutes, with fewer expecting less than 5 minutes, which may differ from the research outcomes if your participants had different expectations.[22]

In another survey from the Eastern Province, 73.8% of people comprehended why certain patients were prioritized over others (room allocation), and 64.8% understood the term "triage."[23] These results are slightly higher than in your study in terms of grasping the priority idea, yet awareness of what triage actually implies remains limited. Furthermore, in that study, education level, age, and previous trips to the ED were substantially related to improved understanding. [23]

There is another study with over 2,000 participants that found that although the mean knowledge score was acceptable (mean ± SD: 8.79 ± 2.13), there were evident gaps: knowledge significantly differed by educational level, employment status, and residence.[24] This supports your finding that education is a strong predictor. Also, that study emphasized inadequate knowledge among some groups, suggesting room for improvement.

A study in the Al-Qassim district indicated that 82.4% of ED visits were for non-urgent illnesses.[25] They also discovered that people who had a high understanding of the triage system differed dramatically from those who did not.[25] The high incidence of non-urgent visits, along with varying awareness, highlights one consequence of insufficient triage understanding: patients may avoid primary care or misinterpret how urgency is judged.

This study has several limitations. The use of a convenience sampling technique may have introduced selection bias and limited the representativeness of the findings, as participants were recruited only from patients visiting emergency departments of Jeddah First Health Cluster hospitals. Furthermore, the use of a self-administered online questionnaire may have excluded individuals with limited digital literacy or access to smartphones, potentially underrepresenting certain groups. In addition, the cross-sectional design restricts the ability to infer causality between patients' awareness of triage and the associated factors.

5. CONCLUSION

In conclusion, the study found that slightly more than half of the study participants had a high level of awareness regarding triage procedures in the emergency department. In addition, the findings found that age and education significantly influenced the patients' level of awareness regarding the triage procedure. Other recent studies across different regions of Saudi Arabia support these findings, showing that higher education and older age groups are consistently associated with greater triage awareness. Prior visits to the emergency department and employment status contribute to better knowledge, while a lack of awareness is often linked to younger individuals and those with lower educational levels.

5.1. Recommendation

Several recommendations are put forward to enhance patients' awareness and utilization of triage systems in the emergency departments of Cluster 1 hospitals and Saudi Arabia more broadly. Hospital managers must organize regular training workshops for patients in the emergency department to improve

their understanding of the triage process and its importance in prioritizing care. Furthermore, the development and strict implementation of standardized triage protocol policies, alongside continuous monitoring of their utilization, is strongly recommended to ensure consistency and efficiency in emergency care. Hospital administrators should also ensure that a visible copy of the triage system protocol is prominently displayed inside the emergency department to serve as a constant reminder and reference point for both patients and healthcare providers.

5.2. List of abbreviations

WHO: World Health Organization, Emergency Department (ED), Institutional Review Board (IRB).

5.3. Ethical Considerations

Ethical approval was obtained from the Jeddah First Health Cluster with Institutional Review Board (IRB) under reference serial number (A01912). Electronic informed consent was obtained through the survey before participation. Responses were anonymous, and no personal identifiers were collected. The data were kept confidential and used solely for research purposes. Furthermore, participants were made aware that their participation was entirely voluntary, and they were given the freedom to quit at any point without any negative impact on their care. In order to be transparent and make sure that participants understood everything, we explained the study's goals, purpose, and how long it would take to finish the survey right at the beginning. All electronic data was securely saved on devices that could only be accessed by the research team using passwords. To ensure the utmost anonymity, we provided the results in aggregate form, making it impossible to identify specific replies. These safeguards restored faith in the study by assuring adherence to ethical research norms.

5.4. Consent to Participate

Electronic informed consent, which was approved by the Institutional Review Board (IRB) of the Jeddah First Health Cluster, was obtained from all participants prior to recruitment into the study. The purpose and objectives of the research, as well as the confidentiality and voluntary nature of participation, were clearly explained in the consent form embedded within the Google Forms questionnaire. Participants were assured that their responses would remain anonymous and would be used solely for research purposes. No personal identifiers were collected. All procedures followed all applicable rules and regulations, including those stated in the Declaration of Helsinki. The form was designed to enhance the consent process by providing details about the expected time to finish the survey, possible advantages of participating (such as helping to improve emergency department patient experiences), and a clear statement that there were no risks involved. A mandatory "I agree" checkbox was implemented to guarantee that the survey could only be completed by participants who had issued explicit consent. Also, they were told they could skip any questions they didn't want to answer and could leave the survey whenever they wanted without explaining why. Consent was guaranteed to be completely informed, freely given, and morally acceptable by following these procedures.

Author contributions: Dr. Ahmed, and Ms. Sarah collaborated on the study title and protocol, Ms. Umkalthom completed the search strategy, reviewed by Ms. Afaf, Ms. Shahad, and Mr. Hassan handled screening, quality appraisal, and data extraction, supervised by Ms. Sarah, Ms. Bashair drafted the manuscript, with input from Ms. Raneem, Dr. Ahmed All authors approved the final manuscript.

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Declaration of conflicting interests: The author(s) revealed no potential conflicts of interest regarding the research, authorship, or publication of this manuscript. Without any outside interference, every step of the research process—from conceptualization to data collecting to analysis and interpretation—was executed meticulously. No financial support, sponsorship, or institutional pressures were received that could have affected the objectivity of the research. This statement guarantees that the study's results are presented honestly and reflect the research team's true opinions and analysis.

Data availability statement: The datasets used and analyzed during the current study are available from the corresponding author on reasonable request. To ensure the confidentiality of participants, only de-identified data will be shared, and access will be granted exclusively for academic and research purposes. Requests for data must include a clear description of the intended use and will be subject to approval by the research team

in accordance with Institutional Review Board (IRB) guidelines. Any data shared will exclude personal identifiers and will be provided in a secure format to maintain compliance with ethical standards.

Supplemental material: Supplemental information for this article is available online. In order to round out the results given in the main text, the supplemental files include more tables and figures that describe the research variables in depth, as well as expanded statistical analyses and supporting material. The goals of providing these resources are to increase openness, facilitate study replication, and provide readers with a better grasp of the research methodology. The supplementary materials can be accessed through the online platform of the journal in addition to the published paper.

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