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EFFECTS OF EMERGENCY DEPARTMENT STRUCTURE ON QUALITY OF CARE IN TAIF HOSPITAL

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Abstract

In order to determine the level of care that is offered to patients, the structure of an emergency department (ED) is an extremely important factor to consider. According to the findings of this study, the organization of the emergency department at **Taif** Hospital has an effect on patient happiness, service efficiency, and the effectiveness of treatment. One hundred twenty patients participated in a survey that was designed to be cross-sectional. The data was collected through the use of structured questionnaires, and it was used to evaluate the patients' experiences with wait times, staff responsiveness, communication, facility conditions, and overall satisfaction. Despite the fact that the ED maintained a high level of professionalism and cleanliness, the results show that patient experiences were significantly impacted by issues such as lengthy wait times, insufficient personnel, and inconsistent communication. After doing statistical analysis, it was shown that there were

significant relationships between the availability of staff, the promptness of medical attention, and overall satisfaction ($p < 0.051$). Even though 56.7% of patients reported being satisfied with the overall experience, there is a need for structural adjustments because there are concerns regarding organizational efficiency, the availability of enough medical resources, and patient participation. For the purpose of boosting the delivery of emergency treatment, the study suggests increasing the number of staff members, optimizing workflow processes, and investing in medical equipment that has been significantly updated. In order to improve emergency department services and the results for patients, hospital administrators and policymakers can benefit greatly from the insights provided by these research.

Keywords Emergency department structure, quality of care, patient satisfaction, emergency care delivery.

Introduction

Emergency medicine is fundamentally a professional service. Emergency physicians instinctively and easily acknowledge that their profession resembles a service business more than a manufacturing facility. Emergency physician organizations, including the American College of Emergency Physicians, have shown interest in comprehending disciplined operations and quality management methods to enhance our primary service function for approximately a decade [1].

The quality planning of the emergency department emphasizes the significance of data-driven insights on customer preferences and requirements. Contemporary emergency department information systems facilitate the advancement of methodologies that provide micro-epidemiologic assistance for emergency department service planning. Contemporary operational theories emphasize the fundamental necessity of establishing a systematic method for communicating with clients. Over the past decade, there has been a proliferation of patient and consumer satisfaction survey tools. When meticulously developed and examined, customer feedback is potent [2].

Clinical outcomes, patient and customer outcomes, cost outcomes, and quality of life are critical considerations. Numerous practitioners and quality experts in emergency medicine assert that quality of life outcomes should encompass not only the patients' quality of life but also the work-life quality of emergency department providers. These conceptual outcomes encourage a discourse on measures [3]. Contemporary issues, such as emergency department overpopulation, test the adaptability of emergency department management paradigms. These issues compel us to recognize that the emergency department functions as a microsystem within the broader hospital macrosystem. This hospital macrosystem operates within a broader framework of regional and national influences, many of which are significantly beyond the control of the emergency department. Focusing on patient flow inside the emergency department microsystem, we see that no universally approved framework exists. The predominant operational domain indicators encompass, but are not restricted to: volume demographic measurements, such as arrivals by hour, occupancy, and more volume demographic metrics [4].

Cycle time metrics include: Arrival to nurse triage, Arrival to bed placement, Arrival to nurse evaluation, Arrival to physician evaluation, Arrival to discharge. Customer satisfaction metrics: Numerous hospital and proprietary survey company metrics incorporate assessments of customer satisfaction regarding various aspects of "wait time." This frequently motivates efforts to enhance emergency department operations concerning waits and delays. Quality of life metrics pertaining to emergency department operations are infrequently observed in the operational practices of emergency departments. Certain hospitals implement employee satisfaction measurements that may yield insights into emergency department personnel satisfaction [5].

The ability of hospital information systems to furnish precise cost data for emergency department operations management has been constrained to yet. Evidence suggests that this is enhancing with unit-based information systems. Metrics typically offered pertain to personnel, equipment, and various expenditures. Billing information is accessible. ED operations management will increasingly

benefit from enabling technologies that collect, organize, filter, synthesize, and disseminate actionable and value-oriented cost data [6].

Researchers addressed the matter of emergency department operations management including complex difficulties such as overpopulation. Regarding overcrowding measures, numerous researchers are endeavoring to establish appropriate measurements for microsystem and macrosystem flow that are applicable within the broader framework of hospital and regional demand-capacity alignment. This underscores the vital significance of interdisciplinary collaboration in operational tasks. Interdisciplinary and interdepartmental collaboration, along with cultural transformation in operations management—microsystems and macrosystems [7].

The diminutive units are referred to as microsystems. The largest entities are referred to as macrosystems. The operating condition and behaviors of interacting microsystems are interdependent. The condition of the bigger organization is somewhat determined by the conditions of its smaller parts, such as the ED [8–12]. Contemporary operations research, utilizing demand-capacity models grounded in queuing theory, elucidates that the condition of the overarching macrosystem (e.g., a hospital operating at full capacity) influences its constituent microsystems and vice versa. In this perspective, ED operations management is considered most effective within the framework of comprehensive system operations management. The concepts of interactions between large and small systems are commonly termed flow principles or demand-capacity matching [13].

Information technology is increasingly facilitating the visibility of these relationships, enabling management through the integration of the components of the whole. The reduction of admission cycle time is affected by the interplay between the Emergency Department and various patient care units, which is contingent upon the collaboration or absence thereof among several supporting microsystems, including environmental services responsible for bed sanitation, bed control that allocates suitable beds, and the physician who determines the admission decision [14].

A patient satisfaction survey was utilized to assess the perceptions of stakeholders in order to attain this objective. Prolonged admission cycle durations were found to negatively impact both emergency department satisfaction and efficiency, as well as inpatient satisfaction levels. Patients awaiting a bed in the emergency department enter the inpatient unit with a negative disposition towards the facility [15-20].

Patients waiting for inpatient beds diminish the functional capability of the emergency department, as do those awaiting consultations and other evaluation and treatment procedures. Information systems grounded in macrosystems and microsystems may assist in identifying origins and patterns of delay. Such data are essential yet inadequate on their own, lacking the cultural components of a willingness to change and the communication tools required to implement interdepartmental enhancements. This prompts a discourse on essential instruments in operations management, specifically in process analysis and persuasion [21].

Study problem

Emergency departments (EDs) are essential in healthcare, delivering immediate medical care to patients. The form and organization of an emergency department can profoundly influence the quality of care, patient outcomes, and overall efficiency. **Taif** Hospital faces issues include congestion, resource distribution, and staff workload, which may impact patient satisfaction and the promptness of treatment. This study seeks to examine the impact of the ED's structure on the quality of care and patient experiences.

Significance of the study

Comprehending the influence of emergency department structure on care quality is essential for enhancing healthcare services, as it directly affects patient outcomes, satisfaction, and overall efficiency. This study examines the correlation between emergency department organization and service delivery, offering insights to decrease wait times, improve treatment efficacy, and optimize resource allocation. Furthermore, the results will enhance workflow efficiency, enabling medical personnel to deliver prompt and effective care. This research seeks to enlighten hospital administrators

and policymakers, facilitating the implementation of evidence-based measures to improve emergency department management and enhance the quality of patient care.

Aim of the work

This study seeks to investigate the impact of emergency department structure on service quality at **Taif** Hospital by evaluating patient satisfaction, treatment efficiency, and healthcare provider performance.

Study questions

1. In what manner does the configuration of the emergency department influence patient wait times and treatment efficacy?
2. What are the primary determinants affecting patient satisfaction in the emergency department?
3. In what ways do staff workload and resource distribution influence the quality of care?
4. What structural enhancements might be proposed to increase patient care and operational efficiency?

Study hypothesis

H_0 (Null Hypothesis): The configuration of the Emergency Department does not significantly influence the quality of care at **Taif** Hospital.

H_1 (Alternative Hypothesis): The configuration of the Emergency Department substantially influences the quality of service, hence altering patient satisfaction, wait times, and treatment results.

Methodology

Study design

The research utilized a cross-sectional descriptive methodology to assess the incidence of emergency department structure on quality of care in **Taif** hospital, Saudi Arabia. A cross-sectional study is especially effective for analyzing correlations between variables and detecting patterns or trends within the target population.

Study setting

The study was performed at the ED of **Taif** hospital, Saudi Arabia. The study was conducted in ED because of their high-stress environment, marked by essential patient care demands and rigorous monitoring needs.

Study population

The study's target population comprised patients in ED at **Taif** hospital, Saudi Arabia.

Inclusion criteria:

- Patients who received treatment in the ED within the study period.
- Patients (or their guardians, in the case of minors) who provided informed consent for participation in the study.

Exclusion criteria

- Patients requiring immediate life-saving interventions, as their priority was urgent medical care rather than research participation.
- Patients unwilling to participate, ensuring that only voluntary and informed participants contributed to the study findings.

Sample size

The sample size was determined based on the total count of ED patients in the chosen institutions. With a 95% confidence interval, a 5% margin of error, and an anticipated burnout prevalence of roughly 60% (derived from other studies), a target sample size of 120 participants was established.

This sample size guarantees adequate statistical power to identify significant correlations between burnout and its associated factors.

Sampling technique

A stratified random sample technique was utilized to guarantee fair representation of ED.

Questioner component and Data collection tool

The questionnaire employed in this study was organized into three primary components to thoroughly evaluate the influence of ED structure on care quality. The initial component, demographic data, collected information regarding respondents' gender, age, educational attainment, previous emergency department visits, and visit frequency to comprehend patient characteristics and their experience with emergency care. The second component, emergency department experience, assessed patient opinions about service efficiency, personnel accessibility, communication quality, attentiveness, wait times for medical procedures, and overall treatment efficacy. Responses were documented on a five-point Likert scale from "Strongly Disagree" to "Strongly Agree," with corresponding p-values denoting statistical significance in pinpointing critical areas of concern. The third component, encompassing facility, resources, and satisfaction, evaluated the cleanliness and upkeep of the ED, the comfort of waiting spaces, personnel sufficiency, availability of medical equipment, organizational efficacy, overall contentment, and the propensity to refer the ED to others. Multiple data collection approaches were utilized to thoroughly assess the influence of ED configuration on care quality. Patient surveys were executed utilizing structured questionnaires distributed to patients or their guardians to evaluate satisfaction levels and perceived quality of care, encompassing factors such as waiting times, communication with medical personnel, overall experience, and departmental efficacy. Furthermore, medical records were examined to get objective data on important performance measures, such as patient wait times, treatment length, and clinical results, facilitating a correlation between structural elements and quantifiable indicators of care quality. Additionally, observational research was conducted in the emergency department to evaluate workflow efficiency, personnel levels, resource allocation, and patient flow. The observations concentrated on pinpointing bottlenecks, congestion, and personnel reaction times to underscore structural inefficiencies impacting service delivery.

The data gathering procedure was executed in three stages:

Phase 1: Ethical permission was obtained from the Institutional Review Board of the participating hospitals. Authorization was secured from hospital administrations to access ED and distribute the questionnaire.

Phase 2: The questionnaire was distributed to ED patients. Participants were provided with clear instructions for completing the questionnaire and were guaranteed the confidentiality and anonymity of their responses.

Phase 3: The collected surveys were evaluated for completeness and validity. The data was then entered into a secure database for analysis.

Data Analysis

The collected data was analyzed using SPSS software, focusing on both descriptive and inferential statistics to achieve a comprehensive understanding of the study findings. Descriptive statistics were utilized to calculate frequencies, percentages, and means for variables such as burnout levels, demographic characteristics, and occupational factors, offering an overview of the sample's profile and the incidence of burnout. Additionally, inferential statistics were employed to determine significant connections between burnout and independent factors.

Results

The demographic characteristics of the survey respondents reveal a rather even gender representation, comprising 58.3% male and 41.7% female participation. The predominant age group among

respondents was 31-40 years, comprising 41.7%, followed by 20-30 years at 33.3%. A smaller percentage belonged to the 41-50 age group (16.7%) and those above 50 years (8.3%), indicating that middle-aged persons were the most prevalent consumers of emergency services. Regarding educational attainment, 50% of respondents possessed a secondary education, while 25% held either primary or tertiary education. A notable 66.7% had previously visited the emergency department, suggesting that a considerable number of respondents possessed past familiarity with the hospital's emergency services. Furthermore, 58.3% were first-time visitors, 25% were occasional visitors, and 16.7% were frequent visitors, indicating a combination of new and returning patients in the poll.

Table 1: Demographic data summary of survey respondents

Category	Option	Number of Responses	Percentage
Gender	Male	70	58.30%
	Female	50	41.70%
Age	20-30	40	33.30%
	31-40	50	41.70%
	41-50	20	16.70%
	Over 50	10	8.30%
Education Level	Primary	30	25 %
	Secondary	60	50 %
	University	30	25%
Have you visited this emergency department before?	Yes	80	66.70%
	No	40	33.30%
How frequently do you visit the emergency department?	First time	70	58.30%
	Occasionally	30	25%
	Frequently	20	16.70%

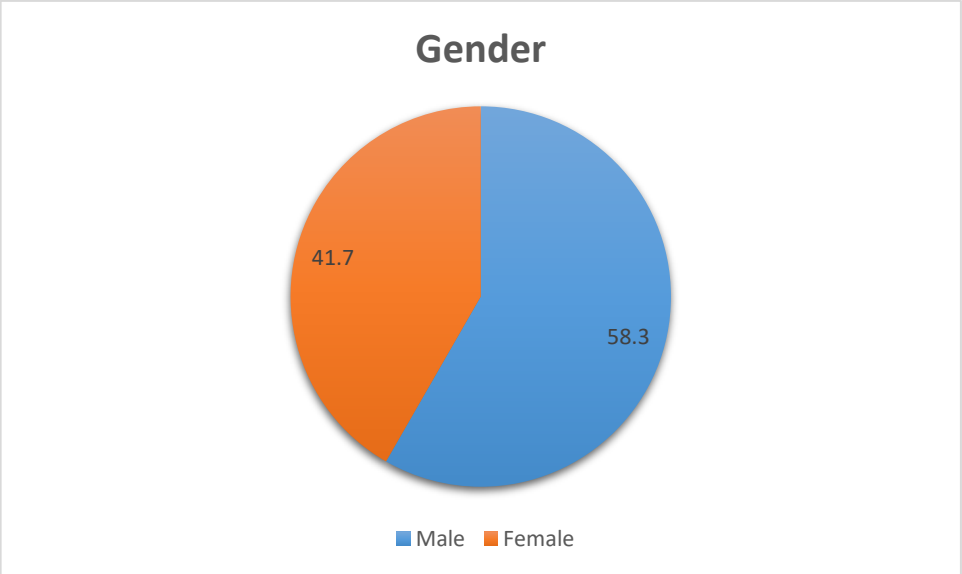

Figure 1: Gender distribution of respondents

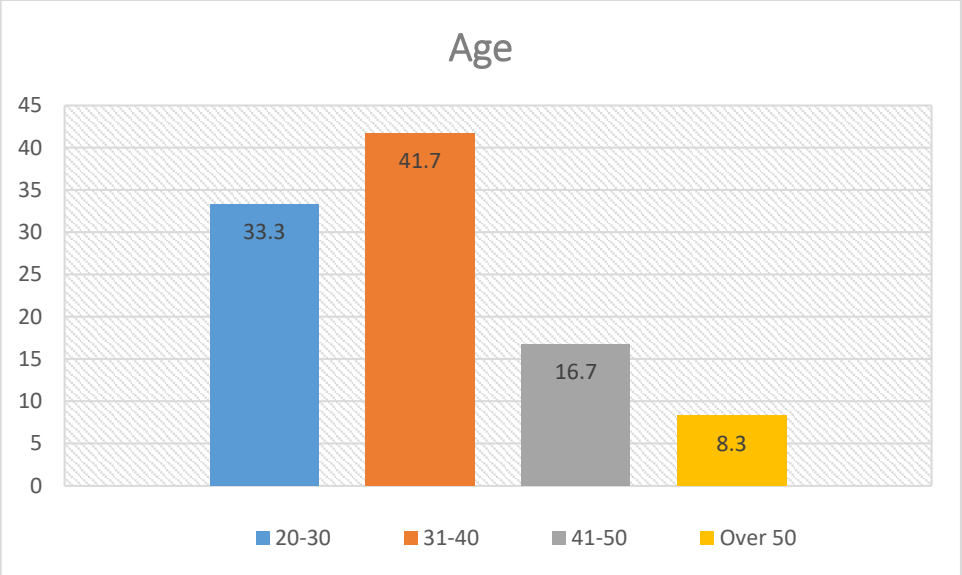

Figure 2: Age distribution of respondents

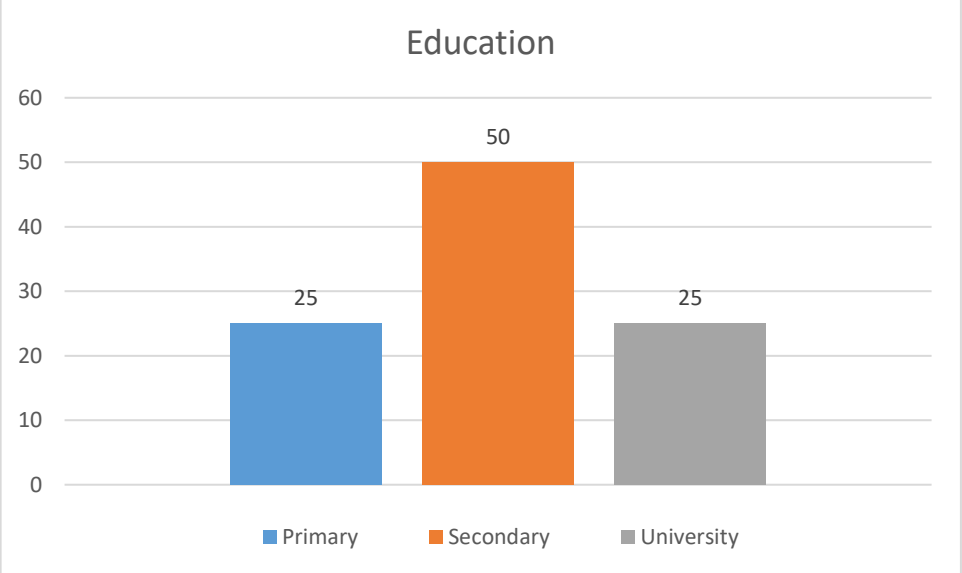

Figure 3: Education level of respondents

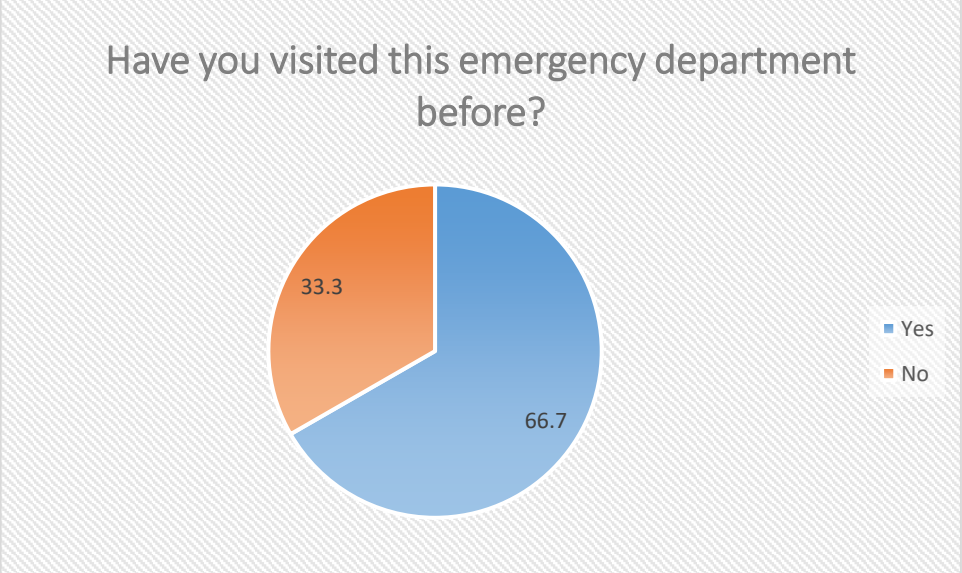

Figure 4: Percentage of patients visited this emergency department before.

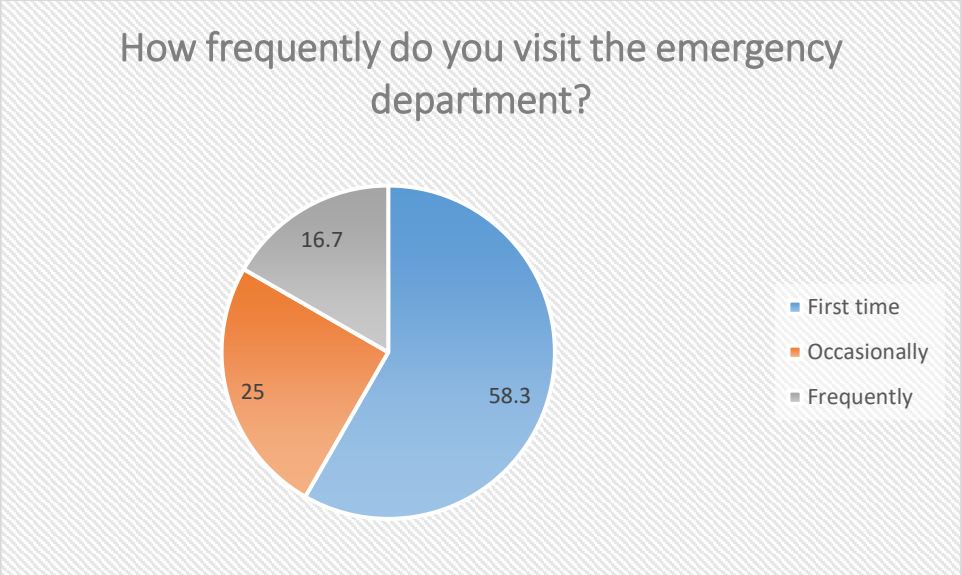

Figure 4: Percentage of frequently patients visit the emergency department

The survey results reveal differing degrees of patient satisfaction over the quality of care in the emergency department. A substantial 33.3% concurred that they received timely medical attention, however a considerable 29.2% either disagreed or strongly disagreed, underscoring concerns regarding wait times ($p < 0.05$). Likewise, 46.7% of respondents concurred or strongly concurred that medical personnel were accessible when required, although 28.3% expressed disagreement, indicating discrepancies in staff responsiveness ($p = 0.2$). Concerning communication, 50% of participants concurred that their disease and treatment plan were elucidated clearly, whereas 25% expressed neutrality, suggesting potential enhancements in patient education ($p = 0.04$). A plurality (52.5%) reported feeling respected and professionally treated by physicians and nurses, whereas 26.6% expressed disagreement, highlighting the necessity for improved interpersonal skills ($p = 0.03$). Staff attentiveness received a positive rating of 54.2%, with a statistically significant p-value of 0.01, demonstrating a robust correlation with patient satisfaction. Of the respondents, 51.7% deemed the wait time for medical testing acceptable, whereas 27.5% expressed dissatisfaction, indicating discontent with diagnostic delays ($p = 0.05$). Ultimately, merely 37.5% concurred that their treatment was beneficial, although 37.5% remained neutral or unsatisfied, prompting questions regarding treatment sufficiency ($p = 0.018$).

Table 2: Emergency department experience

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	P value
I received medical attention in a timely manner.	15 (12.5%)	20 (16.7%)	25 (20.8%)	40 (33.3%)	20 (16.7%)	0.05
The medical staff was available when I needed assistance.	12 (10.0%)	22 (18.3%)	30 (25.0%)	35 (29.2%)	21 (17.5%)	0.2
The emergency staff explained my condition and treatment plan clearly.	12 (10.0%)	18 (15.0%)	30 (25.0%)	40 (33.3%)	20 (16.7%)	0.04
The doctors and nurses communicated with me in a respectful and professional manner.	10 (8.3%)	22 (18.3%)	25 (20.8%)	45 (37.5%)	18 (15.0%)	0.03

The emergency department staff was attentive to my needs.	8 (6.7%)	12 (10.0%)	35 (29.2%)	50 (41.7%)	15 (12.5%)	0.01
The wait time for medical tests (e.g., X-ray, blood tests) was reasonable.	15 (12.5%)	18 (15.0%)	25 (20.8%)	45 (37.5%)	17 (14.2%)	0.05
The treatment I received in the emergency department was effective.	20 (16.7%)	25 (20.8%)	30 (25.0%)	35 (29.2%)	10 (8.3%)	0.018

The survey findings indicate varied patient impressions of the emergency department's environment, personnel, organization, and overall satisfaction. Cleanliness and maintenance garnered favorable responses, with 55% of participants agreeing or strongly agreeing that the ED was well-maintained; nonetheless, 15.8% indicated displeasure ($p = 0.01$). The comfort of the waiting room raised concerns, with 23.3% expressing disagreement, while 51.7% deemed it satisfactory ($p = 0.05$). Concerning staffing, 56.7% affirmed the adequacy of medical personnel, whereas 16.7% opposed this view, highlighting the necessity for improved staff-patient ratios ($p = 0.02$). Views on medical equipment and facilities were polarized, with 41.7% deeming them adequate, but 33.3% opposed this assessment ($p = 0.04$), indicating possible resource constraints. Organizational and management efficiency received mixed evaluations, with 39.2% in agreement and a notable 31.7% in disagreement, indicating potential areas for structural enhancement ($p = 0.09$). Notwithstanding these apprehensions, total contentment was comparatively elevated at 56.7%, while 18.4% indicated unhappiness ($p = 0.05$). Finally, 58.4% of participants expressed a willingness to recommend the hospital's emergency department, but 18.3% would not, highlighting the necessity for improvements in facility comfort, staffing efficiency, and service organization to better patient experiences ($p = 0.04$).

Table 3: Facility, resources, and satisfaction

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	P value
The emergency department was clean and well-maintained.	7 (5.8%)	12 (10.0%)	35 (29.2%)	48 (40.0%)	18 (15.0%)	0.01
The waiting area was comfortable and sufficient.	10 (8.3%)	18 (15.0%)	30 (25.0%)	45 (37.5%)	17 (14.2%)	0.05
There were enough medical staff available to handle the number of patients.	9 (7.5%)	11 (9.2%)	32 (26.7%)	45 (37.5%)	23 (19.2%)	0.02
The equipment and medical facilities were adequate for my treatment.	15 (12.5%)	25 (20.8%)	30 (25.0%)	35 (29.2%)	15 (12.5%)	0.04
The emergency department was organized and managed efficiently.	20 (16.7%)	18 (15.0%)	35 (29.2%)	30 (25.0%)	17 (14.2%)	0.09
Overall, I was satisfied with the care I received at the emergency department.	8 (6.7%)	14 (11.7%)	30 (25.0%)	50 (41.7%)	18 (15.0%)	0.05
I would recommend this hospital’s emergency department to others	9 (7.5%)	13 (10.8%)	28 (23.3%)	50 (41.7%)	20 (16.7%)	0.04

Discussion

This study's findings underscore both strengths and areas needing enhancement in the ED at **Taif** Hospital. Although the department was seen as clean and well-maintained by most, apprehensions over wait times, staffing availability, and service organization persist. The statistic that 29.2% of patients disagreed or strongly disagreed on the timeliness of their medical attention highlights persistent problems with efficiency and patient flow management. Likewise, 28.3% of respondents perceived that medical personnel were not consistently accessible, suggesting potential understaffing or inefficient resource distribution. Communication and professionalism among medical workers received predominantly favorable evaluations; nonetheless, 26.6% of respondents indicated dissatisfaction, highlighting the necessity for enhanced patient engagement and interpersonal skills. Notwithstanding these problems, overall satisfaction was comparatively high at 56.7%, and over half of the respondents would endorse the ED to others. Mixed judgments of organizational efficiency and the sufficiency of medical facilities indicate a necessity for focused structural enhancements to improve patient experience and treatment outcomes.

The findings of this study are consistent with previous research that has been conducted on the influence of the organization of EDs on the quality of care available to patients, notably in areas such as the management of patient flow, the efficiency of staffing, and overall patient satisfaction. In keeping with the findings of prior research, this study discovered that patient satisfaction was severely impacted by lengthy wait times and insufficient personnel, despite the fact that the emergency department received good ratings for cleanliness and professionalism.

A significant problem that was observed was the length of time that patients had to wait for medical attention and diagnostic procedures. Specifically, 29.2% of patients expressed dissatisfaction with the prompt care that they received. In line with prior research that has highlighted emergency department crowding as a significant obstacle in contemporary healthcare systems [1,2], this finding is consistent. When there are not enough inpatient beds available, admitted patients are forced to wait in the ED, which further exacerbates wait times [3]. Overcrowding frequently results in boarding delays. These inefficiencies bring to light the necessity of enhancing patient flow strategies and optimizing resource use, both of which have been investigated in research that have focused on healthcare models and triage procedures in emergency departments [4,5].

The findings of prior research that highlighted workforce shortages as a critical factor in emergency department inefficiencies [6,7] are reflected in the fact that when it comes to staffing availability, 28.3% of patients indicated that medical professionals were not always accessible. Studies have shown that increasing the ratio of nurses to patients and physicians to patients can dramatically increase patient satisfaction as well as the overall outcomes of therapy [8,9]. In addition, research conducted on emergency department care models has shown that the incorporation of multidisciplinary teams can improve care coordination and patient engagement [10].

Another significant problem that was brought to light by this research was the lack of communication that existed between patients and healthcare practitioners. Dissatisfaction was voiced by 26.6% of respondents, despite the fact that 52.5% of respondents felt that they were respected and treated professionally. This indicates that there is a need for improved patient engagement tactics. It has been demonstrated through research that ineffective communication results in decreased patient satisfaction as well as the possibility of medical errors [11,12]. In order to address this issue, it may be possible to implement structured emergency department communication frameworks and increased staff training programs [13]. This would improve both patient trust and adherence to treatment plans respectively.

With regard to the cleanliness of the facility, fifty-five percent of patients gave a good rating to the ED, which is in keeping with studies that indicates that hygiene and environmental factors play a significant impact in patient satisfaction [14]. On the other hand, concerns regarding the availability of medical equipment and the effectiveness of the organization continue to exist, with 33.3% of respondents saying that the facilities are inadequate. This finding is consistent with the findings of

earlier research that have highlighted the necessity of optimizing ED layouts and resource allocation in order to improve workflow efficiency [15,16].

When taken as a whole, this study lends support to the current body of literature about ED organization and quality of care. It highlights the significance of minimizing wait times, strengthening communication, improving personnel efficiency, and optimizing resources. Addressing these concerns through treatments that are supported by research has the potential to greatly enhance both the results for patients and the performance of hospitals. For the purpose of further streamlining emergency department operations and the delivery of patient care, future research should investigate technology-driven solutions such as electronic patient tracking systems and artificial intelligence-driven triage [17-22].

Conclusion

This study suggests that although the Emergency Department at **Taif** Hospital delivers adequate treatment in most aspects, there are considerable chances for enhancement, especially in decreasing wait times, increasing staff response, and improving patient communication. The hospital must prioritize the optimization of workflow efficiency, augment medical personnel during peak hours, and enhance training programs to elevate patient involvement and communication. Moreover, investment in advanced medical equipment and computerized patient tracking systems could optimize diagnostic and treatment processes, minimizing delays and improving care delivery. Despite these issues, the relatively high patient satisfaction suggests that implementing these recommendations could substantially enhance the overall quality of emergency care, hence improving patient experiences and treatment results.

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