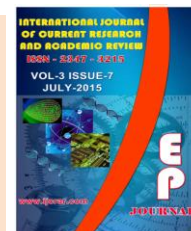




International Journal of Current Research and Academic Review

ISSN: 2347-3215 Volume 3 Number 7 (July-2015) pp. 405-411

www.ijcrar.com



Comparison of Emergency patients' management in Shohada hospital before and after opening the emergency operating room

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KEYWORDS

Emergency,
Operation room,
orthopedics,
triage

A B S T R A C T

The process of hospitalization and handling in the emergency ward is composed of several independent phases with specific characteristics. Undoubtedly, patients' satisfaction with the emergency ward largely depends on the management of the section. The objective of this study was to compare the effect of existence or lack of the emergency operation room on the treatment of patients visiting the emergency ward of Shohada Hospital. In a cross sectional analytical and descriptive study that was carried out in Emergency Medicine department of Tabriz University of Medical Sciences on patients visiting the emergency ward of Shohada Hospital the effect of existence or lack of the emergency operation room on the treatment of patients visiting the emergency ward of this hospital was examined. Of the 760 patients under study, 65.3% were male and 34.7% were female ($P=0.879$). The mean age of patients in the experiment and control groups was 42.66 ± 16.30 and 41.47 ± 15.40 years, respectively ($p=0.302$). The mean duration of the first visit by patients in the experiment and control groups was 5.59 ± 2.46 and 5.39 ± 2.35 minutes, respectively ($p=0.250$). The mean duration of the first nursing initiative taken for the patients in the experiment and control groups was 6.85 ± 2.61 and 6.66 ± 2.47 minutes, respectively ($p=0.299$). The mean time spent to diagnose and decide to hospitalize the patients was 47.38 ± 10.37 and 46.62 ± 9.81 minutes for the patients in the experiment and control groups, respectively ($p=0.298$). The mean time spent by patients in the emergency ward before entering the next ward was 53.59 ± 12.99 and 52.64 ± 12.23 minutes for the patients in the experiment and control groups, respectively ($p=0.297$). The mean time spent before entering the operation room was 469.22 ± 21.09 and 71.44 ± 12.23 minutes for the patients in the experiment and control groups, respectively ($p<0.001$). The mean time for the onset of surgery on patients in the experiment and control groups was 516.40 ± 44.66 and 105.55 ± 25.05 minutes, respectively ($p<0.001$). The mean duration of surgery for the patients in experiment and control groups was 591.49 ± 54.25 and 171.20 ± 39.74 minutes, respectively ($P<0.001$). The mean time spent before leaving the emergency room by patients in the experiment and control groups was 645.15 ± 70.55 and 196.94 ± 47.44 minutes, respectively ($p<0.001$). Finally, the mean release time for patients in the experiment and control groups was 6.42 ± 6.26 and 5.11 ± 6.33 days, respectively ($p<0.001$).

Introduction

None of the aspects of emergency care except the potential of the emergency ward for assessing, treating and diagnosing the treatment for patients within a rational and acceptable time framework has been scrutinized. The process of hospitalization and handling in the emergency ward is composed of several independent phases with specific characteristics. Undoubtedly, patients' satisfaction with the emergency ward largely depends on the management of the section.

The director of the emergency ward can use strategies to make changes and improvements to the process of hospitalization and release of patients from the emergency ward (1). In the studies carried out by Heng-Marilyn et al. in the Surgery Department of Toronto University, it was found out that in six month after the start of operation of the orthopedics emergency operation room the waiting time for patients in the emergency ward decreased and the duration of elective orthopedic actions also declined due to the emergency actions. In addition, the release time and the time used to decide on the condition of patients in the emergency ward also declined considerably. The quality of care provided to patients improved and the golden treatment time was saved in the case of some patients (2).

In the study, which was carried out by Wiler-Jeniffer et al. in the medical sciences department and hospitals of Alabama, it was found out that in the emergency service, the following actions such affect the quality and duration of hospitalization of patients: immediate hospitalization, paraclinic services provided on the bedside, and usage of advanced triage, related protocols, wireless technology, and the high-tech

aimed to record the status of patients in crowded hospitals (3).

In another study, which was carried out by Don-Liew et al. on the duration of hospitalization of patients in the emergency ward, it was hoswed that duration of hospitalization of patients in the emergency ward is directly related to the duration of hospitalization of patients in other hospital wards. Therefore, by taking measures to reduce the duration of stay of patients in the emergency ward it is possible to reduce costs of the health system and mortality rates (4).

Philip-Yoon et al. carried out a study on the factors influencing the stay of patients in the emergency ward. They found that the level of triage, assessments and interventions influence the duration of hospitalization of patients in the emergency ward as independent variables (5).

The emergency operation room for Shohada Hospital was founded in 1997 but no evidence of its contribution to the duration of hospitalization is available. Seemingly, by launching the emergency operation room, the duration of stay of patients in the emergency ward and the total hospitalization time have declined. The objective of this study was to assess the process of treatment of patients before and after the start of operation of the emergency operation room.

Materials and Methods

In a cross sectional descriptive analytical study that was conducted in Tabriz on patients vising the emergency ward of Shohada Hospital the effect of existence or lack of the emergency operation room on the treatment of patients visiting the emergency ward of the Shohada Training and Medical Center was examined.

In this study, 380 files belonging to the period between 1995 and 1996 (before the establishment of the emergency operation room) and 380 files belonging to the period between 1998 and 1999 (after start of operation of the emergency operation room) were studied.

In the course of this project, patients who met the research criteria and did not meet the exclusion criteria were included in the study. The project was launched one month after the final approval.

Exclusion Criteria

1. Imperfect files
2. Patients that did not the operation room
3. Patients that did not need emergency operations
4. Non-traumatic patients

Ethical Considerations

Since the files were examined there was no need for obtaining the consent of the patients but Helsinki criteria were met and the information will remain confidential.

Possible Constraints and Problems and Solutions

The imperfect files were excluded from the study.

Result and Discussion

In this study the files of patients visiting the emergency ward of Shohada hospital were examined to study the effect of existence or lack of the emergency operation room on the treatment of patients visiting the emergency ward of Shohada hospital. The following results were obtained:

The number of patients under study was 760 out of which 380 were put in the experiment group and 380 were put in the control group. Of the 760 patients under study, 65.3% were male and 34.7% were female ($p=0.879$). The mean age of patients in the experiment and control groups was 42.66 ± 16.30 and 41.47 ± 15.40 years, respectively ($p=0.302$).

The emergency ward is one of the most important hospital wards that can considerably affect the performance of other hospital wards and patient satisfaction. Researchers showed that one of the most important criteria for assessing the performance of emergency centers is the time spent by patients waiting to receive diagnostic and treatment services (6-12).

The main objective of the emergency service is to provide medical emergency services. Long term stay in the emergency ward reduces the chance of providing medical emergency services to other patients and results in a decline in patient satisfaction and an increase in the mortalities caused by accidents (11). Researchers have indicated that one of the most important criteria used to assess the performance of emergency centers is the time spent by patients waiting for diagnostic and treatment services (13-14).

Limb et al. examined the effect of waiting time in the emergency ward of California Hospital using a heterogeneous sample. According to the findings, the mean time require for receiving a visit by physicians in the emergency ward is 56 minutes. The duration of the waiting time is 20.1 minutes longer in training hospitals than non-training hospitals. It is also 26.5 minutes longer in public hospitals than private ones (5).

Table.1 Evaluated times in patients between two groups

	Groups		P
	Before opening the emergency operating room	After opening the emergency operating room	
Time of First visit	5.59 ± 2.47	5.39 ± 2.36	0.250
Time of the first nursing action	6.85 ± 2.61	6.66 ± 2.47	0.299
Time of the definitive diagnosis and decision to admit	47.38 ± 10.38	46.62 ± 9.81	0.298
Time of patients exit from the emergency department to stay in the ward	53.59 ± 12.94	52.64 ± 12.23	0.297
Time of the entering the operating room	469.22 ± 21.09	71.44 ± 12.23	<0.001
Time of Surgery starting	516.40 ± 44.66	105.55 ± 25.09	<0.001
Time of Surgery termination	591.49 ± 54.25	171.20 ± 39.74	<0.001
Time of exiting from the operating room	645.15 ± 70.56	196.94 ± 47.44	<0.001
Time of exiting from the hospital	6.43 ± 6.27	5.11 ± 6.33	<0.001

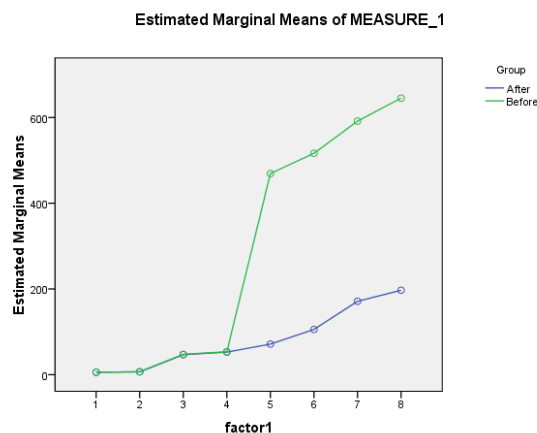


Chart.1 The time change between the two studied groups

Chan et al. studied the effect of long-term stay in the emergency ward on the waiting time, the time required to receive care, and the hospitalization duration in a six-month period in the emergency ward of an academic-urban medical center (15). Clark and Normile carried out a study in Canadian hospitals to examine the effect of timely intervention in the emergency ward on the mortality of patients during their stay in the hospital (16). Hassan-nezhad found that the mean time spent from the triage stage to release from the emergency ward is 71.3 minutes (17).

According to the findings by Dashipour et al. the mean time spent from the first triage to the first visit is 8.3 minutes and the time between the first treatment following triage is 3.73 minutes (18). In his study, Jamali realized that the time spent waiting for the

treatment services after triage is less than 10 minutes in 52% of the patients and is more than 15% in 2% (19).

In our study, the mean duration of the first visit was 5.59+2.46 and 5.39+2.35 minutes for the patients in the experiment and control groups. Therefore, the durations found in our research were less than the aforementioned study. Spite et al. re-designed the processes and carried out interventions to reduce the duration of the emergency procedures from 4 hours and 21 minutes to 2 hours and 55 minutes. They also reduced the time spent waiting for quick care from 52 minutes to 7 minutes. Therefore, duration of the stay of admitted patients and released patients was reduced by 27% and 31%, respectively. According to the report by Vaez-zadeh et al. the mean time for hospitalization in the emergency

ward is 3.6 days for all patients, 3.8 days for traumatic patients, and 3.2 days for non-traumatic patients (20). Chan et al. concluded that long-time stay in the emergency ward leaves a significant effect on the process of circulation for all patients in the emergency ward. Moreover, for each day of long-term residence the waiting time and time before providing services to patients increase (15).

A study was carried out in 1999 in the emergency ward of Al-Zahrah Hospital (in Isfahan) which revealed that the time between entering the emergency ward and getting visited in the screen room is 6.7 ± 1.9 minutes. The time between the screen room and reception of the admission permission is 73.5 ± 40.4 minutes and the time from that point to the end of outpatient services is 55.2 minutes (21).

In our study, the mean time before the first visit was 5.59 ± 2.46 and 5.39 ± 2.35 minutes for the experiment and control groups, respectively. As compared to the results of the aforementioned study the mean time before the first visit was shorter which reflects the high quick provision of emergency services in Shohada Hospital. Moreover, in our study the mean time between release from the emergency ward and residence in one of the wards was 53.59 ± 12.99 and 52.64 ± 12.23 minutes, respectively.

In addition, research results showed that the mean between entrance of patients to the emergency ward and final diagnosis is about 2 hours and 55 minutes. The mean time between final diagnosis and release from the hospital is also about 3 hours (10). In the present study, the hospitalization duration and the time required for making final decisions were shorter than the aforementioned study. However, the mean

time between triage and final decision was measured as the shortest time to the mean work flow.

If no consultation is provided the maximum time required for workflow of patients in the emergency ward will be 70 minutes. A patient for whom laboratory examinations or imaging is requested passes the process in 90 to 110 minutes (22). The mean time between triage and visit by a physician shall be 15 minutes but in present studies the time was calculated to be 22 minutes. The interval between entrance to and release from the emergency ward for patients who do not need examinations and imaging shall be between 60 and 70 minutes (22).

The mean time for the final diagnosis and decision on hospitalization was 47.38 ± 10.37 and 46.62 ± 9.81 minutes for the experiment and control groups, respectively. This duration is less than the duration calculated by Langan in three emergency wards. It was also less than the time obtained by Chor (23).

Moreover, the resulting duration was less than the duration of residence in the emergency ward of three hospitals and a bit more than the duration of residence in the emergency ward of two other hospitals studied by Locaso et al. in 2009. They studied 5 hospitals (24).

On the contrary, the duration resulted from this study was less than the duration obtained by Partovi et al. in the emergency ward of an American hospital (25). This duration was less than the time obtained for Rasoul Akram (PBUH) hospital (346.3) and Firouz Abadi hospital (229.5) (26).

The mean time between triage of patients visiting the emergency ward of the hospital and a visit by a physician as well as the

mean time between triage of patients and the final decision are higher than the standards. Since the emergency medicine is time-dependent (22), perhaps it is possible to partly guarantee the record of the arrival and departure time of patients in the emergency ward by holding short-term training courses and explaining the significance of timing information for determining the future actions of the ward.

Conclusion

Results indicated that the time periods before and after the start of operation of the emergency operation room did not result in different results. However, concerning the time before transfer of patients to the operation room and subsequent periods was significantly shorter for patients who directly entered the operation room as compared to the second group of patients who entered the operation room after hospitalization in the ward. This different reflects the significant effect of the existence of emergency operation room on the acceleration of the treatment procedure and the reduction in the hospitalization duration for patients.

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