



Analysis of Violence in a Crowded Emergency Room

Serkan Emre Eroglu^{1*}, Ozge Onur¹, Ezgi Sağıroğlu¹, Arzu Denizbasi¹
and Haldun Akoglu¹

¹Department of Emergency Medicine, Marmara University Pendik Research and Training Hospital, 34890, Istanbul, Turkey.

Authors' contributions

This work was carried out in collaboration between all authors. Authors SEE and OO conceived the study and designed the trial. Authors SEE, ES, AD and HA supervised the conduct of the trial and data collection. Author OO undertook recruitment of participating patients and managed the data, including quality control. Authors SEE and HA provided statistical advice on the study design and analysed the data; author OO chaired the data over sight committee. Author AD drafted the manuscript, and all authors contributed substantially to its revision. Author SEE takes responsibility for the paper as a whole. All authors read and approved the final manuscript.

Research Article

Received 6th February 2013
Accepted 19th March 2013
Published 2nd April 2013

ABSTRACT

Aims: There is abundant evidence to suggest that health care staff are increasingly being exposed to violent incidents at their workplace. The purpose of our study was to identify the role of crowding in producing violence that occurs in emergency department as well as to outline the factors that affect the types of violence.

Study Design: In this prospective study we collected incidents of violence against emergency staff by patients or their relatives. A survey with 20 questions about the event was completed by emergency staff just after the event. Also information about crowding at that time was recorded as well as the area of the event. Statistical analysis was done with SPSS 16.0.

Place and Duration of Study: Department of Emergency Medicine, Marmara University Pendik Training and Research Hospital, Between April 1 and June 1, 2012.

Methodology: A total of 116 acts of violence were reported during the 61 days of this study. 79 of 116 cases (68.1%) were verbal, 16 (13.8%) physical, and 21 (18.1%) were

*Corresponding author: Email: drseroglu@gmail.com;

both verbal and physical. The information about each event was entered into a database and pooled for analysis.

Results: The most common victims of violence were physicians (38.8%) and security personnel (31.0%). The presence of security personnel in the environment increases the risk of physical violence ($P=0.017$). The average total number of patients waiting for examination or results of examinations was 24.9 ± 1.4 (95% CI, 22.3 – 27.5). It was observed that the violence increased when the number of people was close to this number and reduced when the crowding increased above this average.

Conclusions: The existence of security personnel alone is not sufficient to prevent violence; new steps should be taken to prevent the entrance of the patients' relatives to inside of the treatment areas of emergency departments.

Keywords: Emergency room; workplace violence; crowding; security personnel; emergency staff.

1. INTRODUCTION

The World Health Organization defines violence in health as “a situation of aggressive behaviour, verbal threat, and monetary abuse, physical or sexual attack displayed by the patient, patient's relative or other individuals who constitute a risk for the health worker.” When compared to other professions in the world it has been proven that violence in the health sector is higher [1,2].

In a study carried out in the USA it was found that the risk for health personnel of facing violence is 16 times greater than for other service sector workers. Health professionals face higher levels of violence than prison wardens or police officers [3]. Studies show that 25% of all of the violence during working hours occurred in the health sector and that 50% of health professionals face violence [4]. Among all health care settings, Emergency Departments (EDs) have been identified specifically as high-risk settings for work place violence [5].

Every single healthcare professional is a potential victim [6]. Attacks against health professionals are on the increase and this also affects the health of society in turn [3,7]. Anything threatening the well-being of that workforce threatens the delivery of healthcare. Violence and aggression directed towards healthcare professionals is a longstanding problem within The National Health Service (NHS), and is particularly acute in the Emergency Department (ED). More research is needed to understand the true prevalence of violence occurring in the ED [8]. ED work place violence needs to be addressed urgently by stakeholders through continued research on effective interventions specific to Emergency Medicine.

This article reviews recent epidemiology and research the time of an act of violence displayed against ED personnel and we have analysed the relationship between the crowding of the ED and factors that cause violence in Turkey EDs.

2. MATERIALS AND METHODS

2.1 Place of the Study

The study was conducted at the Marmara University Medical Faculty Pendik Research and Training Hospital in Istanbul, Turkey. Our hospital moved to a new localization at the beginning of 2011. Every day between 800 and 1,500 patients apply to the ED on average.

There are 39 personnel actively working at each shift (08:00-17:00 and 17:00-08:00) in the ED we have studied. The physicians deliver service in 3 areas which are separated based on the condition of the patient. Patients with high risk are treated in the "red area", while patients with low risk but requiring urgent attention are treated in "yellow area" where no patients are required to wait. Patients whose conditions are stable are treated in the "green area" where polyclinic, services are provided. The equivalent of these areas in the Canadian Triage and Acuity scale are; red area= level 1-2, yellow area= level 3, green area= level 4-5. 5 of the 39 staff members are physicians, while 7 are nurses, and 7 are security. Security personnel were present 24 hours in the ED, In our ED, security staff are at fixed locations, such as entrances to ED, critical areas. But there are not any in treatment areas ex. in the trauma room, in the CPR room, etc. In the event of any violent event occurring in an ED, there is a telephone code system as 1111 for the ED to mobilize their security staff to attend to the violent incident.

When the patient enters through the ED, the triage nurse at our hospital takes vital details and basic information for prioritizing care. Then, the patient is sent to the treatment area as (green, yellow or red area) by the triage nurse. The patients are examined by the ED physician initially in these areas. Then, if required, nurses follow the doctor's orders.

2.2 Duration of the Study and Study Design

This was a prospective observational study of workplace violence. This study was performed with volunteer staffs (the personnel that agreed to fill the violence form) who had been the victims of work place violence in the ED between April 1 and June 1, 2012. A reason for excluding an incident from the study was a lack of clear documentation of violence.

A questionnaire containing 20 questions about the exposure to violence was prepared before the study. The questionnaire, named "Event Reporting Form" was handed out to every professional working in the ED before the period of the study. All ED personnel informed about work place violence, the forms of violence and methods of reporting violence. From all trained staff, a formal consent form was taken for participating to this study. When they report a violence event, we again ask for accompanying to the study. If they answer as 'yes', we complete the form for this research. 19 questions of the 20 were to be filled in by the victim of violence, and one question was filled by the responsible physician who monitored patient reception and discharge at that moment. According to this method, the forms were filled in 2 phases. In the first phase the victim of violence filled the forms that were provided by the security personnel at the time of the event giving the reasons for the violence and the outcome, and then handed the form to the physician responsible. In the second phase, the number of patients waiting for examination or for results of examinations was filled in by the responsible physician by using a real-time program called the hospital's information and management system. Our hospital's computer program shows the number of waiting patients in a time point which you select, retrospectively, too. So the number of

waiting patients detected retrospectively by choosing the hour and minute of the event retrospectively by the physician checking the computer system. The total numbers of patients waiting for examination or for results of examination both were entered into a computer system.

The jobs of victims of the violence were classified as: physician, intern physician, nurse, intern nurse, data entry personnel, security personnel, other personnel (cleaning staff, patient handler, etc.). The age, gender, area of responsibility, reason for violence, the term of service in the ED, the job performed at the time of violence were entered as well as the estimated age, and gender of the violent individual(s). Additional questions were on the form, such as: Information on the outcome of the violent event, the final diagnosis, comorbid illness state, and age of the patient, the reason for the visit of the patient who caused the violence and the number of patients waiting in the ED at the time of the event.

2.3 Statistical Analysis

All the data collected were recorded in a Microsoft Excel file. The SPSS v16.0 statistics application was used for analysing the recorded data. The Kolmogorov-Smirnov (K-S) test was applied in order to verify the conformity of the dependent variables to a normal distribution. The Chi-Square test was used for statistics of non-parametrical data. When evaluating the parametrical results, average \pm standard deviation and 95% confidence intervals (95% CI) were used.

2.4 Ethical issues

The Institutional Review Board approved the study. The authors obtained prior consent from the department's staff. Then, verbal consent was obtained only after the violent incident had occurred. The study was conducted in accordance with the principles of the Declaration of Helsinki. Informed consent was acquired from all interviewees.

3. RESULTS

116 cases of violence against the ED personnel were reported within the research term. 79 of 116 cases (68.1%) were verbal, 16 (13.8%) physical, and 21 (18.1) were both verbal and physical. 81% of the violence cases were displayed by patients' relatives (n=94), 12.1% were displayed by the patients and the patients' relatives (n=14), 6.0% were displayed by the patients only and 0.9% were displayed by the physicians (n=1). The average age of the victims of the violence were with 56% male (n=65). Of those responding on the form 53.4% (n=62) stated that 31.0% (n=36) of those committing the violence were between 20 and 30 years of age on average, and 13.8% (n=16) were between 40 and 50 years of age. In our study no statistically significant relationship was observed between the age range of those committing the violence and the type of violence ($P=0.805$, χ^2 test). The average age of patients who can be associated with those committing the violence was 31.1 ± 1.8 (95% CI, 27.4 – 34.9).

76.7% (n=89) of those committing violence were male, and 56.0% (n=65) of the victims of the violence were male. The higher exposure of males to violence was statistically significant ($P=0.013$, χ^2 test). In 9 cases males and females committed violence jointly (7.8%). No females committed physical violence without at least 1 male relative acting with them. In contrast 68.5% (n=61) of males committed verbal violence, 18.0% (n=16) committed

physical violence, and 13.5% (n=12) committed both verbal and physical violence. A significant correlation was observed between the gender of those committing violence and type of violence ($P=.001$, χ^2 test). Although the males those committing had an apparent tendency towards physical violence, when the victim was female the level of violence tended to be lower. It was observed that 43.1% (n=28) of the male victims and 17.7% (n=9) of the female victims were involved in some kind of physical violence, i.e. either solely physical or physical and verbal. A significant correlation was observed between the gender of victims of violence and type of violence ($P=.002$, χ^2 test).

The most dense ED area for violence was the "green area" (25.9%, n=30). This was followed by the "red area" (20.7%, n=24), "yellow area" (17.2%, n=20), the children's examination area (7.8%, n=9), triage area (6.9%, n=8), corridor of the red area (6.1%, n=7), counter (3.4%, n=4), injection room (3.4%, n=4), ED personnels' private rooms (2.6%, n=3), waiting room (1.7%, n=2), corridor of green area (1.7%, n=2) and other areas (2.6%, n=3). Although the violence occurred more frequently in the treatment areas, no meaningful variation was detected between the area and the types of violence involved. (Physical, verbal) ($P=.132$, χ^2 test).

The most common victims of violence in the ED were the physicians (38.8%, n=45), which was followed by security personnel (31.0%, n=36), nurses (22.4%, n=26) and intern physicians (2.6%, n=3). The number of other personnel who were subjects of violence was 6 (5.2%). The average ED working experience of all personnel was 17.2 ± 2.7 months (95% CI, 12.3 – 22.2) while their average working experience in the health sector was 36.1 ± 4.3 months (95% CI, 28.3 – 44.0). On the other hand for physicians the ED working experience and working experience in the health sector were 18.9 ± 2.4 months (95% CI, 11.7-26.2) and 54.2 ± 5.0 months (95% CI, 39.0 –69.4); for security personnel the figures were 7.7 ± 6.1 months (95% CI, 5.6 - 9.8) and 12.0 ± 6.1 months (95% CI, 10.0 – 14.1); 27.7 ± 3.9 month (95% CI, 11.9 - 43.6) and for nurses they were 32.0 ± 3.7 month (95% CI, 16.9 – 47.1).

Accompaniment of comorbid illnesses such as cancer, cerebrovascular diseases etc. of the patient causing the violence was also surveyed in the research. 72.4% did not have comorbid illnesses, and for 25% this was not known.

We have also studied whether the existence of private security personnel or police officers at the scene of violence affects the type of the violence. It was found that security personnel were present during 65.5% (n=76) of the cases of violence, and during 6.9% (n=8) of cases there were police officers at the scene. For only 6 (16.21%) of the cases of violence where physical violence was committed (with or without accompanying verbal violence) were there no security personnel on the scene. In 34 reports (43.0%) of 79 verbal-only cases of violence we found that there were no private security personnel at the scene. This showed that the rate of physical violence was higher when security personnel are present than when there are none. This correlation between the private security personnel and the type of violence was significant statistically ($P=.017$, χ^2 test). For 5 cases (13.52%) of 37, where physical violence played a part, a police officer was available on the scene. For 3 cases (3.8%) of 79, where only verbal violence was committed, a police officer was available on the scene. Although we have observed that there were no police officers available during most of the reports of violence, there was a significant correlation between the availability of the police officer and the type of violence (more only verbal when police present) ($P=.049 < 0.05$, χ^2 test).

According to our study, for 23.3% (n=27) of victims the illness of the patient associated with the aggressor was not known. However, 19.0% of patients (n=22) had traumas, 12.1% of patients (n=14) had local pains, 10.3% of patients (n=12) had complaints of the gastrointestinal system, and 8.6% of patients (n=10) had neurological complaints. Complaints of labour, psychiatric and genitor-urinary problems were the rarest and occurred in 3 patients for each of these (2.6%). However the final diagnosis was not known for 37.9% of the patients who were associated with the violence. After any violence the event was recorded for the hospital general security staffs, the patient was taken from the scene and usually those patients left the hospital and chose to go another medical center. The final diagnoses of these patients are lacking, and triage informations did not used for the final diagnosis. Another 17.2% left ED (n=20) with trauma a related diagnosis, 8.6% (n=10) had a gastrointestinal diagnosis, and 7.8 (n=9) had a respiratory diagnosis. The number of patients with a final psychiatric diagnosis was 6 (5.2%). The number of patients with a final trauma diagnosis was 22(19.0%), 14 of them (63.6%) committed verbal violence. The number of patients with a final diagnosis of pain complaint in any body region was 14 (12.1%), 11(78.6%) of them committed verbal violence. The analysis showed that there was a statistically significant correlation between the complaint of the patient at the time of arrival and the type of violence ($P=.021$, χ^2 test).

While the violence against ED personnel can be committed at any time, the most frequent time of day for personnel to be exposed to violence was between 20:00 and 22:00 (37.5%) (Fig. 1-2). Again the same time interval included the greatest number of the verbal incidents (22.8%). The time interval when verbal and physical violence was committed jointly was between 14:00 and 16:00 (19.0%). Taking all types of violence into account between the hours 20:00 and 22:00 was the interval when the violence is highest (n=26) relative to other times (Fig. 2). The physicians between these hours were exposed to 2.5 times more violence than other staff. However no statistically significant correlation was observed between the time of the violence, the profession of the victim, the type of violence (physical, verbal, etc.) and the violent individual (patient, patient relative, etc.) ($P= .166$, $P= .758$, $P= .450$, χ^2 test).

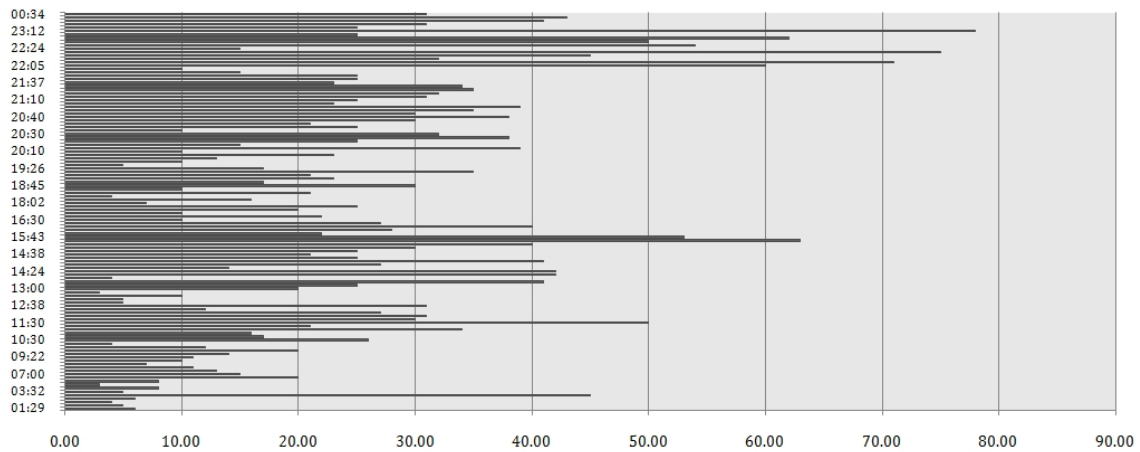


Fig. 1. The number of the patients waiting to be examined at the violence time

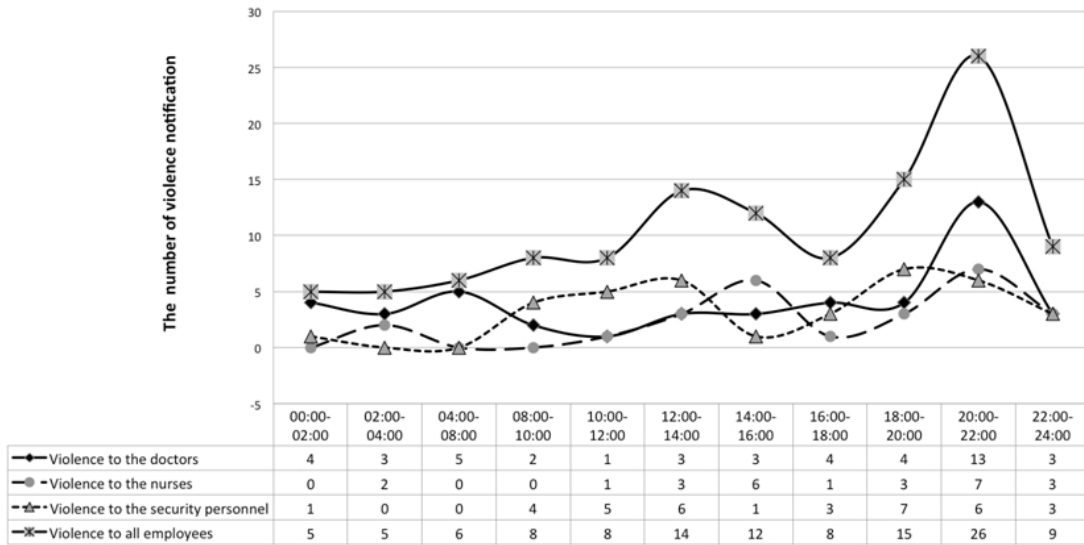


Fig. 2. The distribution of violence by hours in the Emergency Department

The data on the time of violence were also studied. According to this analysis 37.9% of ED personnel (n=44) stated that they were dealing with diagnosis and treatment procedures of patients other than violent patient. 11.2% of the personnel (n=13) were analysing findings, 7.8% of the personnel (n=9) were visiting patients, 38% of the personnel (n=44) were handling other tasks related to their work. We observed that there were also some personnel who were doing other activities when they were exposed to violence. 1.7% of total of those were resting/eating (n=2), 3.4% were walking in the ED in between tasks (n=4). Another situation associated with the time of violence was the crowding in the ED. When all the responses were analysed the average number of patients at times of violence was 24.9 ± 1.4 (95% CI, 22.3 – 27.5). For the practitioners this number was 27.0 ± 1.7 (95% CI, 22.0 - 32.0), and for the nurses it was 29.2 ± 1.2 (95% CI, 24.3 - 34.0), for special security personnel it was 20.9 ± 1.1 (95% CI, 17.1 - 24.8), for data entry personnel it was 24.3 ± 8.7 (95% CI, 2.6 - 46.0), and for the assistant health personnel it was 20.3 ± 6.1 (95% CI 5.1 - 35.5). After analysis of the data it was found that when the number of patients waiting in the ED increased above 20-30, the reports of cases of violence were lower (Fig. 3). However no statistically significant correlation was found between the number of patients and the type of violence or the profession the victim ($P= .888$ and $P=.590$, χ^2 test).

According to this study the most common reason for starting an act of violence was “request for priority of a service”. This reason was observed very frequently after the number of patients waiting in the Emergency Room exceeded 10. The most common outcome of the violence was patients’ and relatives’ leaving of the ED (Table 1). After a denial of service requests 28 cases of verbal violence (73.7%) occurred, and 11 cases occurred after a relative was not permitted to stay with the patient (55.0%). However no statistically significant correlation was seen between either of these and the type of violence ($P= .694$, $P=.283$, χ^2 test). There was verbal violence in 32 cases which resulted in the patients and relatives leaving the hospital and in 16 cases (48.5%) this resulted in the arrest of the violent individual. No statistically significant relationship was observed between leaving the hospital and the types of violence ($P= .552$), but there was a significant correlation was found with the arrest by security personnel ($P= .01$, χ^2 test) and the nature of the violence.

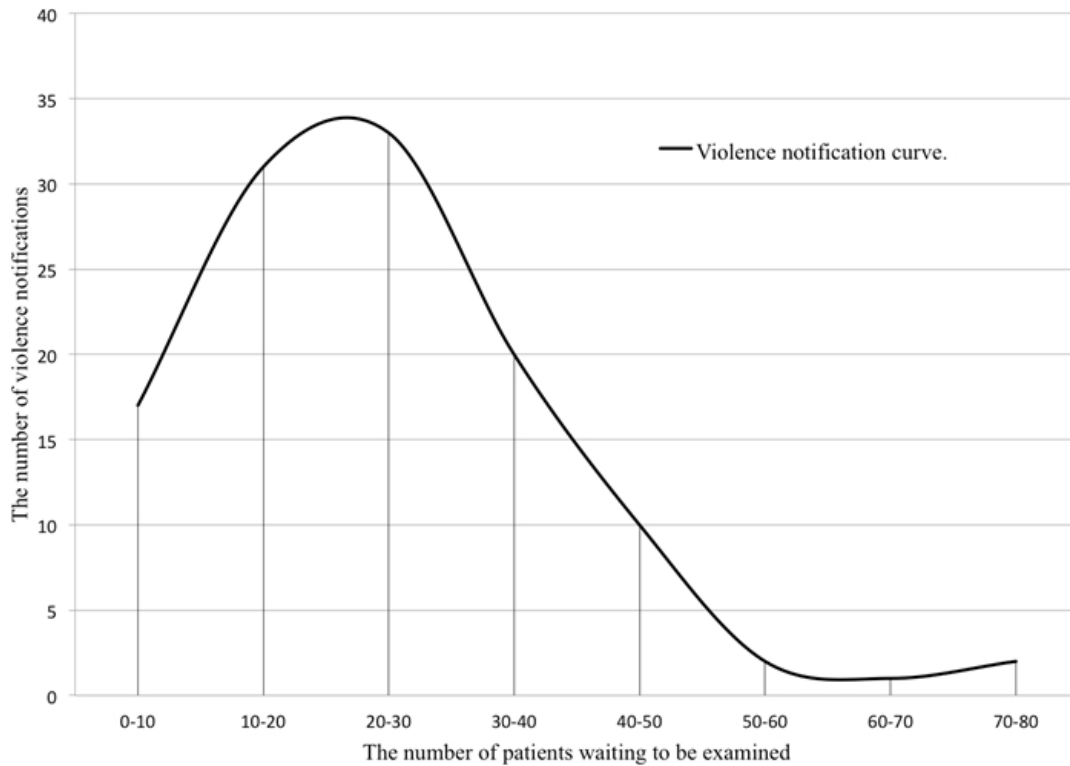


Fig. 3. The number of patients waiting to be examined in the emergency department & reports of violence

4. DISCUSSION

There are many violence victims in the health service sector as in all sectors. The cases of violence in the health sector increase every day. Many past studies showed that the most risk prone department is the ED [9-13]. Every separate health institution has a different exposure to violence. However on average it is reported to be between 37 and 80%. [14] In our study we have observed that almost 2 incidents occurred per day, which highlights the high percentage.

Whereas some studies have reported that the nurses are the most frequent victims of violence [7], others studies have shown that the physicians are the most frequent victims of violence [15-17]. In our study nurses were exposed to fewer cases of violence compared to physicians and security professionals. Since we have identified that the relatives committed much more violence than the patients, this must be a result of physicians and security personnel having more interaction with the relatives.

Table 1. Most common types of violence committed and their outcomes based on the total number of patients waiting in the emergency service

| The number of patients waiting/Reason - Result | | (%, n/N) |
|---|---|---------------------------------|
| 0-10 patients | <i>Reason:</i> Not permitting the relative to closely accompany the patient | (35.3%, 6/17) (23.6%, 4/17) |
| | Denial of request for inappropriate examination/analysis by patient or relative | (29.4%, 5/17) |
| | <i>Result:</i> The patient and relatives left the hospital | (23.5%, 4/17) |
| | Originator of violence was arrested by security personnel | |
| 10-20 patients | <i>Reason:</i> Denial of request for priority of service | (29.0%, 9/31) |
| | Not permitting the relative to closely accompany the patient | (16.1%, 5/31) (38.7%, 12/31) |
| | <i>Result:</i> Originator of violence is arrested by security personnel | (25.8%, 8/31) (25.8%, 8/31) |
| | The patient and relatives left the hospital Resolution through dialogue | |
| 20-30 patients | <i>Reason:</i> Denial of request for priority of service | (36.4%, 12/33) |
| | Late analysis results | (21.2%, 7/33) |
| | <i>Result:</i> The patient and relatives left the hospital Originator of violence was arrested by security personnel | (48.5%, 16/33) (24.2%, 8/33) |
| 30-40 patients | <i>Reason:</i> Denial of request for priority of service | (40.0%, 8/20) |
| | Late analysis results | (25.0%, 5/20) |
| | <i>Result:</i> The patient and relatives left the hospital Originator of violence was arrested by security personnel | (50.0%, 10/20) (35.0%, 7/20) |
| 40-50 patients | <i>Reason:</i> Denial of request for priority of service | (70.0%, 7/10) |
| | Denial of request for inappropriate examination/analysis by patient or relative | (30.0%, 3/10) |
| | <i>Result:</i> The patient and relatives left the hospital Originator of violence was arrested by security personnel | (30.0%, 3/10) (20.0%, 2/10) |
| 50-60 patients | <i>Reason:</i> Denial of request for priority of service | (n=1, N=2) |
| | Not permitting the relative inside the patient's area | (n=1, N=2) |
| | <i>Result:</i> The patient and relatives left the hospital The health professional sought legal justice | (n=1, N=2) (n=1, N=2) |
| 60-70 patients | <i>Reason:</i> Denial of request for priority of service | (n=1, N=1) |
| | <i>Result:</i> The patient and relatives left the hospital | (n=1, N=1) |
| 70-80 patients | <i>Reason:</i> Denial of request for priority of service | (n=1, N=2) |
| | Late result of consultation | (n=1, N=2) |
| | <i>Result:</i> The patient was examined by another physician Resolution through dialogue | (n=1, N=2) (n=1, N=2) |

The findings of our study were not compatible with international studies where patients were identified as the most frequent originators of violence at the healthcare sector [18,19]. However, our study is compatible with the results of many other studies carried out in Turkey [20-23] which may lead us to conclude that different factors specific to Turkey may lead patient relatives towards more violence compared to patients. This may be a result of cultural differences as well as health care policies; the insufficient skills and lower number of the personnel, and the architecture of the ED. It is very common in Turkey that the patients visit the ED with close or remote family members even sometimes with neighbours regardless of the patients' ages or the severity of complaints. When we add the patients'

relatives to the number of patients treated in our ED, the crowding in the ED becomes excessive. Especially when the number of personnel is insufficient, all of the activities not directly related with the treatment are carried out by relatives. There are some factors that increase the risk of violence: The high number of relatives and insufficient number of personnel leads to unequal level of communication; the relatives demand to stay close to the patient at all times even when this is against the rules; environmental factors related to the crowding such as lack of physical space, high environment temperature, high level of noise, and increased waiting-times for examination. Many studies in the literature show that the crowding in the ED increases the aggression and risk of violence [17, 24-25]. Our study also showed an increase in the reports of violence when there are significant numbers of patients waiting. However when the ED is exceedingly crowded the number of reports dropped. This makes a curve similar to a Gaussian curve, which is unidentified in earlier studies as far as we know. The reasons that creates this situation can be identified as: 1) When the ED is not crowded the main reason for violence is the rejection of an inappropriate demand; 2) When there is medium-high crowding in the ED the main reason for violence is the waiting and extension the treatment period; 3) When there is excessive crowding in the ED the patients also realize the number of patients exceed the capacity of the ED and then may be the patients and relatives are preparing themselves psychologically against possible problems. 4) When there is excessive crowding the patient and relatives can foresee the long waiting time upon entrance and if their complaints are not urgent then they may be leaving the ED. 5) Staff may have been too busy during the very busy periods to report what they may have perceived as less serious episodes of violence (especially verbal abuse) and this may have led to the apparent low rate at periods of long waiting.

In our study, we found that there was a significant correlation between the complaint of the patient at the time of arrival and the type of violence. We may say that patients with trauma and pain complaints are potential committers of violence, and special attention must be directed to this group.

The ages of patients of families with a tendency towards violence are young and very few have a comorbid sickness; this fact may lead to the conclusion that actual cases of violence are committed by the patients and relatives that are not in the critical patient group. Therefore we may expect that the origin of the violence is very loosely, But inversely related to the level of sickness of the patient. Likewise our study has identified the most frequent area where the violence is committed as the "green area"; this fact also supports the above idea. However when the reasons are considered (Table 1.) the most frequent reason is "request for priority of service"; this show that the patients' relatives do not share the opinion of healthcare professionals about the existence of a critical condition. But this may also be a result of a sinister approach aiming to bypass the crowding of the ED. The crowding in the "green area" may lead some patients or their relatives to decide to take this approach. Although the priority of service should have been requested from the triage nurse, practitioner, injection nurse/phlebotomist or the security personnel, the frequency of cases of violence in the triage area and injection room was found to low in our study. This might be the result of a policy which gives more authority to the physician in making the last decision over priorities, even though the triage sets the "priority code". This thought can also be supported by the fact that the physicians are being exposed to more violence during late hours compared to other personnel (Fig. 2).

Nowadays in many emergency services patients' relatives are not allowed into the patients' rooms. However in some emergency services, as in our subject ED this restriction is not followed. Our observation that highlights the patient relatives as the originators of violence

also supports the idea that these restrictions are not followed efficiently. When the increased violence in the health care sector is considered from recent years, it is evident that the "human barrier" created by the private security personnel will not be sufficient. Also, the security staff members are the least experienced people in the ED according to our study. Perhaps this is the reason behind the statistically meaningful relationship between the availability of security staff and higher levels of physical violence. However this conclusion must not be related solely to job experience. Since the security personnel's duty is to protect other personnel of the ED, they may have become direct and open targets. This probability shows that the security should not be supported only by the human factor rather it should be supported by people and technology combined. The hospital administrations should have the ED architecture reviewed and special physical barriers should be constructed. Since this is a long term solution, short and simple solutions should also be considered by healthcare managers. One of the solutions can be to carry our detailed studies on the correct positioning of personnel deployed in the emergency services. Education, courses, emergency communication training, results of management control tests, even gender can be considered when positioning the personnel.

It is not surprising to find that most of the originators of violence are males in our study. The importance of education and good manners starting from childhood is very important for stopping the aggressive behaviour of male gender, not only for lesser levels violence in healthcare situations, but also for the good of social life. Since females can also commit violence when there is a male with them, females also have a potential for violence and, therefore, applying the above approach only for males will not be correct. Therefore, preventive approaches should be prepared by professionals in a scientific way, covering the entire society. According to our study the type of violence (verbal, physical) was correlated with the originator's gender and with the victim's gender. Avoiding exposure of violence towards women in society may be a cultural result. In this social environment, males fighting with females (especially with those they do not already know) are not welcome, and are dishonoured since it means that the male is "only as strong as the women". Therefore an alternative solution may be deploying ladies with positive communication skills as security personnel at the first level of contact with patients and deploying male security personnel only as a second level, as assistants.

Perhaps the most important reason for violence is a lack of communication. The expectations of the patients and their relatives on arriving at the ED may not match the work principles of the personnel deployed at the ED and trying to help them. The violence may occur when a practitioner rejects the injection demanded by the patient, when the security personnel refuse to let in a relative to a prohibited area, or when the triage nurse does not place the patient in the critical classification. Along with these reasons, other reasons such as delays due to malfunction of laboratory equipment or computer systems can cause increase in the level of aggression. Not wearing uniforms, "specialists of violence" can be employed for monitoring the aggression levels of patients and their relatives while all other healthcare and security personnel are working on their tasks, and for reporting the developments to the ED staff. During a tense interaction the originator of violence can target all the personnel in uniforms deployed in the ED. This assumption is supported by the fact that even some personnel walking by in ED are attacked as found in our study. The personnel not wearing a uniform may help "calm down" the people with a tendency towards violence. Another important benefit of these non-uniformed personnel could be the possibility that they reduce the stress load on the patients and their relatives either through timely communication with them or by taking preventive actions. On the other hand as proposed by Rallies-Peterson in 2001, deploying "welcoming personnel" who welcome the patients and

them about the ED operations and a introduces a possible latency can also reduce the level of aggression [26].

4.1 Limitations

In our study, the numbers of patients waiting for an examination were used for the investigation of the degree of overcrowding. Unfortunately, we did not calculate the whole number of patient's relatives. This is the main limitation of the study.

Although education about violence types was done before the study, emergency staff might feel that verbal aggression was a regular occurrence and maybe some of the verbal aggression was off the record. Also crowding of ED might reduce record of all events. Some of our findings may be based on our cultural differences.

5. CONCLUSION

All personnel deployed in the ED can be affected by violence directly and indirectly. All institutions including the national and hospital administrations, education and justice departments and the media, must take preventive actions to stop the effects of violence on the health sector. Two cases of violence every day is a scary scenario for the future, and makes us think that there will be physical violence leading to deaths sooner or later. Studies targeting a solution are needed even more than before.

ACKNOWLEDGEMENTS

Special thanks to Dr. Ray Guillery for the English edition of the manuscript. We would like to also thank the Institutional Review Board for their approval of this study.

COMPETING INTERESTS

All authors have declared that no support from any organization for the submitted work; no financial relationships with any organizations that might have an interest in the submitted work in the previous years; no other relationships or activities that could appear to have influenced the submitted work.

REFERENCES

1. Annagür B. Violence towards healthcare staff: risk factors, after effects, evaluation and prevention. *Current Approaches in Psychiatry*. 2010;2:161-73.
2. US Bureau of Labor Statistics Website, US Bureau of Labor Statistics. Revisionstothe 2007 Census of Fatal Occupational Injuries (CFOI); 2007. Available: http://www.bls.gov/iif/oshwc/cfoi/cfoi_revised07.pdf.
3. Kingma M. Workplace violence in the health sector: a problem of epidemic proportion. *International nursingreview*. 2001;48:129-130.
4. Kocadağ S, Akdur R. Sağlık Çalışanlarında İşyeri Şiddeti. 12.ulusal Halk sağlığı kongresi. Ankara. 2008;253.
5. Kowalenko T, Cunningham R, Sachs CJ, Gore R, Barata IA, Gates D, Hargarten SW, Josephson EB, Kamat S, Kerr HD, McClain A. Workplace violence in emergency medicine: current knowledge and future directions. *Journal of Emergency Medicine*. 2012;43:523-31.

6. Steffgen G. Physical violence at the workplace: consequences on health and measures of prevention. *European Review of Applied Psychology*. 2008;58:285-95.
7. Shepherd JP, Farrigon DP. Assault as a public health problem: discussion paper. *Journal of the Royal Society of Medicine*. 1993;86:89-92.
8. Knowles E, Mason SM, Moriarty F. I'm going to learn how to run quick: exploring violence directed to wards staff in the Emergency Department. *Emergency Medicine Journal*. 2012 Oct 25. doi:10.1136/emered-2012-201329
9. Gerberich SG, Church TR, McGovern PM, et al. An epidemiological study of the magnitude and consequences of work related violence: the Minnesota Nurses' Study," *Occupational & Environmental Medicine*. 2004;61:495-503.
10. Gerberich SG, Church TR, McGovern PM, et al. Risk factors for work-related assaults on nurses. *Epidemiology*. 2005;16:704-9.
11. Department of Health and Human Services, National Institute of Occupational Safety and Health. Violence: occupational hazards in hospitals; 2011. Available: <http://www.cdc.gov/niosh/pdfs/2002-101.pdf>.
12. Critical Incident Response Group. National Center for the Analysis of Violent Crime, FBI Academy. Workplace violence: issues in response. Quantico, VA: US Department of Justice. Federal Bureau of Investigation; 2003.
13. May DD, Grubbs LM. The extent, nature, and precipitating factors of nurse assault among three groups of registered nurses in a regional medical center. *Journal of Emergency Nursing*. 2002;28:11-7.
14. Talas MS, Kocaöz S, Akgüç S. A survey of violence against staff working in the Emergency Department in Ankara. *Asian Nursing Research*. 2011;5:197-203.
15. Foust D, Rhee KJ. The incidence of battery in an urban emergency department. *Annals of Emergency Medicine*. 1993;22:583-5.
16. Anglin D, Kyriacou D, Hutson H. Residents' perspectives on violence and personal safety in the emergency department. *Annals of Emergency Medicine*. 1994;23:1082-4.
17. Kowalenko T, Walters B, Khare R, Compton S. Workplace violence: a survey of emergency physicians in the state of Michigan. *Annals of Emergency Medicine*. 2005;46(2):142-147.
18. Adib SM, Al-Shatti AK, Kamal S, El-Gerges N, Al-Raqem M. Violence against nurses in healthcare facilities in Kuwait. *International Journal of Nursing Studies*. 2002;39(4):469-478.
19. Lin YH, Liu HE. The impact of workplace violence on nurses in South Taiwan. *International Journal of Nursing Studies*. 2005;42(7):773-778.
20. Acik Y, Deveci SE, Gunes G, Gulbayrak C, Dabak S, Saka G, Vural G, Bilgin NG, Dundar PE, Erguder T, Tokdemir M. Experience of work place violence during medical specialty training in Turkey. *Occupational Medicine*. 2008;58(5):361-366.
21. Aydin, B, Kartal M, Midik O, Buyukakkus A. "Violence against general practitioners in Turkey. *Journal of Interpersonal Violence*. 2009;24(12):1980-1995.
22. Ayranci U. Violence toward healthcare workers in emergency departments in West Turkey. *The Journal of Emergency Medicine*. 2005;28(3):361-365.
23. Boz B, Ergin A, Erdur B, Kurtulus A, Turkcuer I, Ergin N. Violence toward healthcare workers in emergency departments in Denizli, Turkey. *Advances in Therapy*. 2006;23(2):364-369.
24. Shoghi M, Sanjari M, Shirazzi F, Heidari S, Salemi S, Mirzabeigi G. Work place violence and abuse against nurses in hospitals in Iran. *Asian Nursing Research*. 2008;2(3):184-193.

25. Mirza NM, Amjad AI, Bhatti ABH, Mirza FTZ, Shaikh KS, Kiani J, Yusuf MM, Khan MU, Nazir ME, Assad Q, Humayun A, Kiani IG, Amjad SI, Imam SZ. Violence and abuse faced by junior physicians in the Emergency Department from patients and their caretakers. A nation wide study from Pakistan. *The Journal of Emergency Medicine*. 2012;42(6):727-733.
26. Rallis-Peterson D. When a patient turns violent. *RN*. 2001;64(5):32-35.

© 2013 Eroglu et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<http://www.sciencedomain.org/review-history.php?iid=205&id=12&aid=1182>