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Evaluation of Non-Fatal Injuries with Relation to Where Assaults Occur

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Abstract: The aim of the present study was to determine where injuries due to violence mostly occur and to find differences (if present) among where the assaults places in 334 patients who sustained injuries due to reasons other than accidents, randomly selected from the medical records and files of those referred to the Department of Traumatology of the Council of Forensic Medicine between 1 January and 31 December 1998 in İstanbul.

The majority of both the injured (82.9%) and the accused (96.3%) were males. The distribution of places where assaults occurred in the order of frequency was as follows; workplaces (37.4%), outdoors (26.6%), homes (20.7%), and places of entertainment (9.9%). While females were often victims of violence in homes, males were affected elsewhere more frequently ($p<0.001$). In terms of the seasons during which the incidents occur, no significant difference was found among the scenes of crime. Violence mostly prevailed between 12:00 and 18:00 hours in workplaces and outdoors, whereas it showed peak incidence in places of entertainment and homes between 18:00 and 24:00 hours. While penetrating injuries were more abundant in places of entertainment, workplaces and outdoors, blunt injuries were mostly encountered in homes. Victims are mostly injured by their spouse and close relatives (43.1%) in homes, and by their neighbours and friends (44%) in workplaces.

Key Words: Violence, injury, places of assault

Introduction

Violence has become one of the most important public health problems. Death and injury due to violence, and material and spiritual losses arising from these are increasing every day. It is important that the characteristics of the atmosphere in which injuries arising from violence take place should be defined. Violence is also closely connected with the personality of both the individual who practises it and the person who is subjected to it (1,2). While individuals such as policemen or security personnel are directly liable to risks of violence with relation to their occupation, taxi drivers and people working in hotels, motels and petrol stations are easily accessible for criminals with intentions of robbery. In such places, the losses people mostly suffer are an indirect outcome of the actual incident (for example, robbery).

Peek-Asa and Kraus, in their study on injuries due to violence, particularly in workplaces, determined that the rate of susceptibility to assault in individual industry constituted 73.1% of all workplace injuries. They also emphasised the fact that there was need for a country-wide routine record and data flow system for developing precautionary strategies and for determining the characteristics of non-fatal injuries due to violence in workplaces (3,4). Kraus and Brown, in an investigation in California in which they examined risk factors in injuries arising from savage acts in violence-prone professions and industries, reported that office (working) and meeting hours constitute the periods of high risk in workplace injuries, and that owners of retail businesses (self-employed/small-scale tradesmen), employees in administrative sectors and service industries (particularly taxi drivers, policemen/women, security personnel, owners and workers of off-licences, fast-food outlets and restaurants, and personnel in petrol stations) are at the highest risk (5). Durkin et al. stated that injuries due to violence are 4.5 times more common in low socioeconomic classes and that socioeconomic inequalities should be taken into account in efforts to prevent violence (6). However, in Denmark, 30% of men and 11% of

women injured due to violence were wounded in restaurants and similar places (7).

In the present study, taking places of assault as the basis, our aim was to determine where injuries mostly occur and whether there is any difference among these sites of crime.

Materials and Methods

In the current study, in order to determine where injuries due to violence mostly occur and to find differences (if present) among the places of assault, 334 cases were evaluated. In these cases, the places where the incidents took place were known and the victims sustained injuries due to reasons other than accidents. The victims were randomly selected from the medical records and court files of those who were referred to the Department of Traumatology of the Council of Forensic Medicine between 1 January and 31 December 1998 for the preparation of reports, and were evaluated with regard to time and scene of crime, type of injury, and information on the victims and accused. Since data for each parameter could not be retrieved from the records for all cases, only the available information was evaluated.

Occupations of victims and accused were classified in seven groups:

Group 1: Unemployed /housewife

Group 2: Self-employed (such as accountants, merchants, quilt makers, taxi drivers, restaurant/cafe owners, contractors, tailors, football players, butchers, hair dressers, automobile salesmen, mechanics, grocers and green-grocers, sellers of furniture, owners of billiard halls, welders, fishmongers, hotel/motel owners, and bakers)

Group 3: Civil servants and pensioners (teachers, policemen/women, health personnel, military officers and others who work for the government)

Group 4: Students

Group 5: Blue-collar workers (waiters, office boys, drivers, bakery workers, secretaries, porters, bodyguards, carpenters, etc.)

Group 6: Agriculture workers (farmers, shepherds, and cattle herders)

Group 7: Other occupations

The places where assaults occurred were grouped under 8 headings:

Group 1: Workplaces and surroundings (farms, gardens, pastures, forest, factories, shops, hospitals, military camps, airports, etc.)

Group 2: Schools and surroundings

Group 3: Prisons

Group 4: Vehicles (buses, taxis etc.)

Group 5: Outdoors (open fields, roads, highways, sports clubs, petrol stations, outside law courts, car parks, garbage dumps, etc.)

Group 6: Places of entertainment (wedding halls, discos, cafes and restaurants)

Group 7: Homes and surroundings

Group 8: Police stations

Results

Table 1 illustrates the distribution of victims according to sex and places where assaults occurred. The data show that 82.9% (277 men) of the victims were male and 17.1% (57 women) were female, whereas these values for the accused were 96.3% and 3.7% respectively. The frequency of places where assaults occurred in decreasing order were found to be: workplaces (37.4%), outdoors (26.6%), homes (20.7%) and places of entertainment (9.9%). The majority of females were injured in homes, but male victims were mostly wounded in workplaces. The difference between the locations of incidents for men and women was statistically significant ($p<0.001$).

The distribution of where assaults occurred on the basis of season in which they took place is shown in Table 2. It was found that most of the violent incidents occurred during spring (34.5%) and that they happened least in winter (20.6%). However, no statistically significant difference was found between the seasons and occurrence of such events ($p>0.01$).

The distribution of the places where assaults occurred according to the time of the day at which they occurred is shown in Table 3. Between 12.01 and 18.00 hours (34.3%) and between 18.01 and 24.00 hours (33.2%) were the two time intervals when violence was at its highest level in all of the places where assaults occurred.

Table 1. Distribution of where assaults occurred according to sex of victims (İstanbul, 1999).

Places	Male		Female		Total	
	n	%	n	%	N	%
Workplaces	113	40.8	12	21.1	125	37.4
Outdoors	76	27.4	13	22.8	89	26.6
Homes	40	14.4	29	50.9	69	20.7
Places of entertainment	31	11.2	2	3.5	33	9.9
Schools	4	1.4	1	1.8	5	1.5
Prison	6	2.3	-	-	6	1.8
Vehicles	4	1.4	-	-	4	1.2
Police stations	3	1.1	-	-	3	0.9
Total	277	100.0	57	100.0	334	100.0

X^2=37.3 p<0.001 (X^2 was calculated for the first four places)

Table 2. Distribution of seasons of assault according to where assaults occurred (İstanbul, 1999).

Places	Spring		Summer		Autumn		Winter		Total	
	n	%	n	%	n	%	n	%	N	%
Workplaces	40	38.1	25	23.8	24	22.9	16	15.2	105	100.0
Homes	27	39.2	15	21.7	13	18.8	14	20.3	69	100.0
Outdoors	22	24.7	23	25.9	22	24.7	22	24.7	89	100.0
Places of entertainment	13	39.4	7	21.2	4	12.1	9	27.3	33	100.0
Total	102	34.5	70	23.6	63	21.3	61	20.6	296	100.0

X^2=8.91 p>0.05

Table 3. Distribution of where assaults occurred according to time of day (İstanbul, 1999).

Places	06:00-12:00		12:00-18:00		18:00-24:00		24:00-06:00		Total	
	n	%	n	%	n	%	n	%	N	%
Workplaces	36	33.0	39	35.8	29	26.6	5	4.6	109	100.0
Outdoors	14	16.3	35	40.7	29	33.7	8	9.3	86	100.0
Places of entertainment	2	6.5	12	38.7	13	41.9	4	12.9	31	100.0
Homes	10	15.9	13	20.6	25	39.7	15	23.8	63	100.0
Total	62	21.4	99	34.3	96	33.2	32	11.1	289	100.0

X^2=33.4 p<0.01 For the statistical analysis, time intervals were grouped as 06:00-18:00 and 18:00-06:00

After midnight the number of violent incident decreases considerably. Violence mostly prevails between 12.01 and 18.00 hours in workplaces and outdoors, whereas it shows the highest incidence in places of entertainment and homes between 18:00 and 24:00 hours. On the other hand, workplaces are the safest places during this period. In homes, violence continues to be high between 12.00 and 06.00 hours, whereas workplaces are the safest places during these hours.

The distribution of places where assaults occurred according to the ages of the victims and the accused are shown in Tables 4 and 5. The data show that 14.9% of the victims were adolescents or children (19 years old or younger), and 85.1% of the victims were older than 19 years. Children and adolescents constituted 17.5% of the accused. Children and adolescents were usually injured in places of entertainment. In homes, children were less exposed to violence. People over 50 years of age were the group least involved in violent incident. The 20-49 age group was most frequently involved in such events.

Table 6 shows the distribution of the type of injuries according to the places where the incidents occurred. While penetrating injuries (wounds) were more abundant in places of entertainment, workplaces and outdoors, blunt injuries were mostly encountered in homes.

The distributions of the occupations of the victims and the accused are shown in Tables 7 and 8. Both among the victims and the accused the most frequently involved group was agricultural workers and self-employed groups. Unemployed women/housewives (36.8%) constitute the major group among those harmed in homes. In workplaces, agricultural workers (53-54%) form the main body of both the victims and the accused, whereas the main group of accused in places of entertainment was self-employed people.

Victims were mostly injured by their spouse and close relatives (43.1%) in homes, and by their neighbours and friends (44%) in workplaces. In general, most of the injuries were caused by relatives and friends (85%).

As far as the data obtained from the records of the

Table 4. Distribution of where assaults occurred according to ages of victims (İstanbul, 1999).

Places	0-19		20-49		50 and over		Total	
	n	%	n	%	n	%	N	%
Workplaces	15	12.2	81	65.8	27	22.0	123	100.0
Outdoors	16	18.4	63	72.4	8	9.2	87	100.0
Places of entertainment	7	22.6	21	67.7	3	9.7	31	100.0
Homes	8	11.9	45	67.2	14	20.9	67	100.0
Total	46	14.9	210	68.2	52	16.9	308	100.0

X^2= 9.78 P> 0.1

Table 5. Distribution of where assaults occurred according to ages of accused (İstanbul, 1999).

Places	0-19		20-49		50 and over		Total	
	n	%	n	%	n	%	N	%
Workplaces	20	20.2	61	61.6	18	18.2	99	100.0
Outdoors	16	21.1	58	76.3	2	2.6	76	100.0
Places of entertainment	5	18.5	19	70.4	3	11.1	27	100.0
Homes	4	7.3	49	89.1	2	3.6	55	100.0
Total	45	17.5	187	72.8	25	9.7	257	100.0

X^2= 6.28 P< 0.05 For statistical analysis, workplaces and outdoors as well as places of entertainment and homes were combined

Table 6. Distribution of type of injuries according to where assaults occurred (İstanbul, 1999).

Places	By weapon		sharp By firearm		Blunt injuries		Total	
	n	%	n	%	n	%	N	%
Workplaces	38	30.4	32	25.6	55	44.0	125	100.0
Outdoors	26	29.2	26	29.2	37	41.6	89	100.0
Places of entertainment	16	48.5	10	30.3	7	21.2	33	100.0
Homes	13	18.3	19	26.8	39	54.9	71	100.0
Total	93	29.2	87	27.4	138	43.4	318	100.0

X^2= 13.50 P< 0.05

Table 7. Distribution of occupations of victims (İstanbul, 1999).

	Workplaces		Outdoors		Places of entertainment		Homes		Total	
	n	%	n	%	n	%	n	%	N	%
Agricultural labourers	66	54.1	25	33.3	8	38.1	14	24.6	113	41.1
Self-employed	27	22.1	19	25.3	6	28.6	8	14.0	60	21.8
Workers	14	11.5	13	17.3	4	19.0	4	7.0	35	12.7
Unemployed/Housewives	4	3.3	5	6.7	1	4.7	21	36.8	31	11.3
Civil servants	11	9.0	7	9.3	-	-	7	12.3	25	9.1
Students	-	-	6	8.0	2	9.6	3	5.3	11	4.0
Total	122	100.0	75	100.0	21	100.0	57	100.0	275	100.0

Table 8. Distribution of occupations of accused (İstanbul, 1999).

	Workplaces		Outdoors		Places of entertainment		Homes		Total	
	n	%	n	%	n	%	n	%	N	%
Agricultural labourers	66	54.1	25	33.3	8	38.1	14	24.6	113	41.1
Agricultural labourers	62	53.4	27	38.0	7	31.8	19	35.8	115	43.9
Self-employed	27	23.3	24	33.8	10	45.4	18	34.0	79	30.1
Workers	14	12.1	5	7.0	2	9.1	3	5.7	24	9.2
Civil servants	11	9.6	3	4.2	1	4.6	4	7.5	19	7.3
Unemployed/Housewives	2	1.7	4	5.6	2	9.1	8	15.1	16	6.1
Students	-	-	8	11.3	-	-	1	1.9	9	3.4
Total	116	100.0	71	100.0	22	100.0	53	100.0	262	100.0

Council of Forensic Medicine permit, a probable relationship between places where assaults occurred and alcoholic drinks consumed by the injured and the accused before the incident was also investigated. The distribution of alcohol consumption by the victims and the accused is shown in Tables 10 and 11. It was found that if the incident occurred in a place of entertainment, both the victims and the accused were consuming alcoholic drinks at the time. If the violence took place in workplaces, such consumption was discovered to be minimal.

The hospitalisation rate subsequent to assault is shown in Table 12 and whether the injury was life threatening or not is shown in Table 13. The data show that 81.8% of people injured at places of entertainment and 53.6% of cases wounded in homes were hospitalised. Out of all the injuries, 1/3 were life threatening. There was no statistically significant difference between severity of the trauma and the place where the assault occurred ($p>0.05$).

Discussion

Our findings on the distribution of the sex of the victims and the accused were in accordance with earlier studies (7-10), where males constituted the major group involved. In the present study, 96.3% of the victims and 89.2% of the accused were men. This might be attributed to a man's active role in the community.

The 4 main groups of assault places and their frequencies determined were workplaces (34.7%), outdoors (26.6%), homes (20.7%), and places of entertainment (9.9%). The correlation examined between the above-mentioned scenes of incidents and sex of the victims revealed that women were mainly injured in homes, whereas men were predominantly victims of assault in places other than homes. The difference was statistically significant ($p<0.001$, Table 1). This finding is in line with other studies conducted in Turkey and in other countries (8,10-13). In Denmark, for example, it has been found that 30% of the men and 11% of the

Table 9. Distribution of relationship between victim and accused according to where assaults occurred (İstanbul, 1999).

	Workplaces		Outdoors		Places of entertainment		Homes		Total	
	n	%	n	%	n	%	n	%	N	%
Agricultural labourers	66	54.1	25	33.3	8	38.1	14	24.6	113	41.1
Neighbour/friend	44	44.0	21	30.0	7	33.3	11	16.9	83	32.4
Spouse/close relative	8	8.0	1	1.4	1	4.8	28	43.1	38	14.8
Other relatives/Acquaintances	36	36.0	31	44.3	10	47.6	24	36.9	101	39.5
Unfamiliar/other	12	12.0	17	24.3	3	14.3	2	3.1	34	13.3
Total	100	100.0	70	100.0	21	100.0	65	100.0	256	100.0

Table 10. Distribution of alcohol consumption by victims (İstanbul, 1999).

Places	Alcohol(+)		Alcohol(-)		Total	
	n	%	n	%	N	%
Workplaces	1	1.2	82	98.8	83	100.0
Outdoors	16	30.2	37	69.8	53	100.0
Places of entertainment	13	59.1	9	40.9	22	100.0
Homes	8	16.7	40	83.3	48	100.0
Total	38	18.4	168	81.6	206	100.0

$X^2= 45.52$ $P< 0.001$

Table 11. Distribution of alcoholic drink consumption by accused (İstanbul, 1999).

Places	Alcohol(+)		Alcohol(-)		Total	
	n	%	n	%	N	%
Workplaces	9	12.0	66	88.0	75	100.0
Outdoors	11	25.0	33	75.0	44	100.0
Places of entertainment	14	77.8	4	22.2	18	100.0
Homes	7	21.2	26	78.8	33	100.0
Total	43	25.0	129	75.0	172	100.0

X^2=34.51 P<0.001

Table 12. Distribution of hospitalisation rate of victims according to where assaults occurred (İstanbul, 1999).

Places	Hospitalised		Not hospitalised		Total	
	n	%	n	%	N	%
Workplaces	77	61.6	48	38.4	125	100.0
Outdoors	62	69.7	27	30.3	89	100.0
Places of entertainment	27	81.8	6	18.2	33	100.0
Homes	37	53.6	32	46.4	69	100.0
Total	203	64.2	113	35.8	316	100.0

X^2=9.34 P<0.05

Table 13. Distribution of the severity of the injury according to where the assaults occurred (İstanbul, 1999).

Places	Life threatening		Not life threatening		Total	
	n	%	n	%	N	%
Workplaces	33	45.2	73	54.8	106	100.0
Outdoors	27	36.5	47	63.5	74	100.0
Places of entertainment	9	29.0	22	71.0	31	100.0
Homes	25	41.7	35	58.3	60	100.0
Total	94	34.7	177	65.3	271	100.0

X^2=2.42 P>0.05

women injured were assaulted at restaurants, cafes etc. (7). In Southern California, administrative personnel and people working in trade and service sectors are the groups mostly involved in violence at workplaces. Injuries due to assaults at work were calculated to be 148 in social services and 106 in health services per hundred thousand population. No data is available for Turkey with respect to this.

With reference to seasons, we discovered that violence seems to wane during winter and increase its intensity in summer (Table 2), and it reaches its peak in May. The National Statistics Institute (NSI) publishes a

report in which the distribution of criminal acts with regard to climate is covered. Üge reported that violence escalates in June and September and declines in winter months.

Non-fatal injuries arising from assaults had the highest incidence between 12:00 and 18:00 (34.3%), which is followed by the period between 18:00 and 24:00, with a frequency of 33.2%, which is quite close to that of the preceding phase. After 24:00, there was a marked decrease in the number of assaults. The rate of violence was highest between 12:00 and 18:00 in workplaces and outdoors, whereas the assault rate showed peak incidence in places of entertainment and homes between 18:00 and 24:00. During this last period, workplaces were the safest places. Although the number of non-fatal injuries due to assaults in homes was highest between 18:00 and 24:00, in the subsequent period (i.e., 24:00 to 06:00) this particular place had the highest violence rate (23.8%). However, workplaces were the safest places during these hours (Table 3). Kraus and Brown, in an investigation in California in which they examined risk factors in injuries arising from savage acts in violence-prone professions and industries, reported that office (working) and visit hours form the highest periods of risk with regard to workplace injuries.

Regardless of the site of incident, individuals between 20 and 49 years of age made up the group dominantly involved in violence both among the harmed and the accused alike. People above 50 years of age were found to take part less in all kinds of crime. Children and adolescents were involved less in violence in homes and places of entertainment (Tables 4 and 5). This may be ascribed to a tradition in Turkey, where cases arising from violence within a family and involving children are not usually taken to court or the police. Consequently, we can say that young adults have more active lives and are thus involved in acts of violence more frequently than the older age groups (above 50 years old), who mostly prefer a more tranquil life style (10,11,15). In South Africa and Philadelphia, the 20-29 age group males were mostly involved in assaults; in Santiago, Chile (9), 15-24 age group males; in Denmark (7) 15-19 age group males; and in Massachusetts (16) 20-24 age group males. In studies carried out in Sivas, Turkey, in 1989 and 1995 (8), and in studies conducted by Üge (14) and Aral (18), the judicial statistics showed that young adults were involved in violence more than other age groups were. In the studies mentioned above, the relationships between where the assault took place and the ages of the victims and accused were not evaluated. In workplaces, agricultural labourers constituted the main body of both the victims and the accused, whereas the main group of accused in places of entertainment were self-employed people. Unemployed women/housewives made up the major group among those wounded in homes. Most of the victims and the accused were injured on farm land and in places of entertainment. The majority of the accused were self-employed (Tables 7 and 8). Peek-Asa and Kraus, in their study on injuries due to violence particularly in workplaces, determined that the rate of susceptibility to assault in individual industries constituted 73.1% of all workplace injuries (3). In our study, if the self-employed group and agricultural sectors are accepted as individual industries, then the rate of susceptibility to assault in an individual industry is 76.2%. This is in accordance with Peek-Asa and Kraus' results. Kraus and Brown, in an investigation in California in which they examined risk factors in injuries arising from savage acts in violence-prone professions and industries, reported that office (working) and visit hours formed the periods of high risk with regard to workplace injuries, and that owners of retail businesses (self-employed/small-scale tradesmen), employees in administrative sectors and service industries (particularly taxi drivers, policemen/women, security personnel, owners and workers of off-licences, fast-food outlets and restaurants, and personnel in petrol stations) are at highest risk (5).

Victims were mostly injured by their spouse and close relatives (43.1%) in homes, and by their neighbours and friends (44%) in workplaces. Eighty-five percent of all acts of violence were caused by relatives or acquaintances (Table 9).

In places of entertainment, where alcoholic drinks were available, the frequency of alcohol consumption was the highest both among the victims and the accused, and, in workplaces, the frequency of imbibing alcoholic drinks was the lowest (Tables 10 and 11). The low frequency of drink consumption is a preferable result.

While penetrating wounds were more abundant in places of entertainment, workplaces, and outdoors, blunt injuries were mostly encountered in homes (Table 6). Places of entertainment were the locations where firearms and sharp instruments are often (78.8%) used.

Out of all injuries, 2/3 of the victims had to be hospitalised and 1/3 of the injuries were life threatening. No statistically significant difference was found between the severity of the injuries and the scenes of crimes ($p>0.05$, Tables 12,13).

The cost of violence to individuals and to society is very high. Ponzer et al. (21) examined hospital admissions and found that when people experience a firearm assault during their lifetime, their morbidity rate was higher compared to people who have never experienced such events. In addition, suicides and murders were higher among these people. These groups were more inclined to take risks, and recurrent traumas and anti-social behaviour were common (chronic trauma syndrome). The medico-social and legal complications are too high for society. For these group of patients, only medical treatment is not sufficient. Programmes for changing their life styles must be developed for prevention.

There is an urgent need for violence prevention programmes since violence is one of the most important public health problems in many countries (1-5). However, epidemiological studies are necessary to in order determine the priorities, risk groups and the prevention programmes. In our study, we discovered that the majority of people involved in violence were male, in the 20-49 age group, and self-employed, and the victims were mostly injured by their spouse and close relatives. Violence prevention programmes must primarily aim to include the groups mentioned above. In Turkey, the rate of increase in assault cases is nearly 3 times the population increase rate. This is another reason for conducting such studies in Turkey (19-21)*. For collecting reliable data, hospital and police records have to be rearranged and more detailed information on were assaults take place and the occupations of those involved must be collected.

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* This increase rate is evaluated from the 1990 Population Statistics and 1994-1995 Judicial Statistics by the researchers.

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