JOURNAL OF ADOLESCENT HEALTH 2000;27:434–442

INTERNATIONAL ARTICLE

Intentional Injuries Among the Young: Presentation to Emergency Rooms, Hospitalization, and Death in Israel

ROSA GOFIN, M.D., M.P.H., MALKA AVITZOUR, M.P.H., ZIONA HAKLAI, M.A., AND NAVAH JELLIN, M.P.H.

Purpose: **To study the incidence and outcome of intentional injuries requiring emergency room (ER) care among children and adolescents in a national sample.**

Method: **The population included 0- to 17-year-olds who presented to the ER for injuries in 23 hospitals over a 1-year period. A 6% to 9% random sample of days was selected in each hospital, and for each selected day the relevant ER record was reviewed for cause, nature, and outcome of injuries and sociodemographic information.**

Results: **The annual incidence for intentional injuries resulting in ER visits was 19.6 in 10,000 children and adolescents aged 0 to 17 [95% confidence interval (CI) 17.4–21.8 in 10,000]. Fights/assaults constituted 54.1% of the presentations, abuse and rape, 10.3%, and self-inflicted injuries, 10.8%. Overall rates were higher among 10- to 17 year olds than at younger ages. The rates were higher among boys than girls for fights/assaults and abuse, whereas attempted suicide and rape were three times higher among girls than boys. Nearly twice as many Jewish children and adolescents presented to the ER for intentional injuries than Arab children and adolescents, with the ratio becoming even greater for attempted suicide.**

Of all the intentionally injured, 21.7% were hospitalized. The mortality rate was 1.1 in 100,000 (95% CI = .7–1.7/100,00) with no significant gender difference observed. No cases of suicide were reported for the Arab population.

Conclusions: **Adolescents aged 10 years and older are at higher risk for intentional injuries than younger children. The ethnic differences evident in this study, especially for attempted and completed suicide, may be real or the result of differential disclosure of information owing to sociocultural norms or differential recording by health professionals.** ***© Society for Adolescent Medicine, 2000***

KEY WORDS:
Abuse
Assaults
Gender differences
Intentional injuries
Rape
Self-inflicted injuries
Israel

Acts of violence and their health consequences have only recently been recognized as a public health problem (1). This recognition stems from the increasing awareness of both the general public and professionals, and a parallel increase in media reporting (2). The issue of violence is particularly pertinent to the younger population, whether as victims or as perpetrators. In a cross-cultural study of the health and behavior characteristics of youth in 28 countries (including Israel) (3), between 10% and 78% of adolescents aged 11–15 years reported involvement in bullying either as perpetrators or as victims. More than a third of ninth through 12 graders in the

From the Department of Social Medicine. Hadassah Medical Organization and the Braun School of Public Health and Community Medicine of the Hebrew University and Hadassah (R.G., M.A.); Information and Computer Services, Ministry of Health (Z.M.); and Kupat Holim Clalit Sick Fund (N.J.), Jerusalem, Israel

Address correspondence to: Rosa Gofin, M.D., M.P.H., Hadassah University Hospital, Ein Karem, Jerusalem 91120, Israel. E-mail: gofin@cc.huji.ac.il

Manuscript accepted December 1, 1999.

1054-139X/00/$–see front matter
PII S1054-139X(00)00091-4

Published by Elsevier Science Inc., 655 Avenue of the Americas, New York, NY 10010

United States have consistently reported involvement in physical fights in the previous 12 months (4–6). In another U.S. study, 105 child deaths were identified over a 2-year period as school-related violent events (7). Children and adolescents are also the victims of abuse and neglect. Rates of 5.7 in 1000 for physical abuse, 3.4 in 1000 for emotional abuse, and 2.5 in 1000 for sexual abuse were reported in a national study in the United States (8). Any information on this subject is shaped by methodologic issues regarding case definition, target population, instruments used, and method of data collection, as well as by political influences (9). Self-inflicted injuries, whether fatal or not, are a distinct problem of adolescence. The frequency of suicide is reported to be increasing in the United States and is the second most common cause of death in this age group after motor vehicle accidents (1,10).

Most of the data on intentional injuries are from mortality statistics. These statistics, although readily available, represent only the tail end of a continuum. Information about nonfatal injuries caused by violence that required medical attention is scarce. This information is vital for estimating the magnitude of the problem and understanding the epidemiology of intentional injuries to design appropriate preventive intervention programs. In the present study, we examined a national sample of those intentional injuries among children and adolescents that required presentation to emergency room (ER) and their outcomes with respect to gender, ethnicity, and place of residence.

Population and Method

The population included all 0 to 17-year-olds who presented to 23 ERs (of a total of 28 ERs in the country) from January 1, 1994, to December 31, 1994. There were 1,905,500 children in this age group in 1994 (11); of those, 75% were Jewish and 25% Arab (including Moslems, Christians, and Druze). The age distribution within the age range criterion was comparable for both ethnic groups. Eighty-eight percent of both Jewish and Arab children and adolescents lived in urban areas (over 2000 inhabitants according to the Israel Central Bureau of Statistics) (11). A computer-generated random sample of days over the period was drawn for each hospital: 24 days (6%) for 11 hospitals where the total number of ER visits of 0 to 17 year olds was $\geq$20,000, and 36 days (9%) for 12 hospitals with $<$20,000 annual visits to the ER of children that age. These ratios were selected to give an adequate representation of all days of the week and all months in the year. With this sample size, it would be possible to detect an incidence of at least 1%, with a 95% confidence interval (CI) of 0.79–1.24%. The survey was approved by the ethics committee of the Ministry of Health and permission was obtained for record review from the director of each hospital and each ER.

For each day included in the sample, all ER records were reviewed and all presentations with diagnosis of injury or poisoning (n = 11,058) were extracted. The cases were then classified by cause according to the ICD-9 External Causes of Injury code (E-800–999) and nature of injury codes (800–999) (12). In 15% of cases only the nature of the injury was recorded. Only the first consultation for the injury was included in the study. Intentionality of the injury was determined according to the medical file. In this study we present only data pertaining to intentional injuries (E-950 to E-969). Training of 12 field workers and ongoing quality control of the data collection were performed to minimize misclassification. Data accuracy was reviewed again when the research coordinator entered results into the computer.

Analysis of the data was performed using SPSS-WIN (Chicago, IL: SPSS Inc.). The number of cases was weighted to 365 days, with crude and specific annual rates per 10,000 child years calculated. The denominator used was the 1994 midyear population of 0 to 17 year olds or the respective age, gender, ethnic group, or place of residence figures for the specific group (11). The standard deviation (SD) of the weighted rates was calculated assuming that the number of injured follow a Poisson distribution. Using these SDs, the 95% CI was calculated assuming a normal approximation for the Poisson distribution.

Grouped data on all fatal cases were obtained from the Ministry of Health. Death rates were calculated per 100,000 child-years. Ratios of ER presentation, hospitalization, and death were calculated by counting each case once using death as the unit of comparison. Chi-square statistics were used to calculate differences between rates and between ratios.

Results

In total, 3827 presentations to the ER for intentional injuries for this age group were estimated, providing a rate of 19.6 in 10,000 (95% CI = 17.4–21.8/10,000) children 0 to 17 years old, or 1 in 498 children. This

Table 1. Causes of Intentional Injuries, by Age

	Age (yr)				
	0–4	5–9	10–14	15–17	Total
Fight/assault (E-960.0-961-966, 968)					
n	61	293	828	889	2071
Rate/10,000	1.3	5.4	16.1	29.7	10.6
95% CI	0.3–2.2	3.2–7.7	12.1–20.2	22.8–36.7	9.0–12.2
Suicide attempt (E-950-958)					
n			71	343	414
Rate/10,000			1.4	11.5	2.1
95% CI			0.2–2.5	7.2–15.8	1.4–2.9
Abuse (E-967)					
n	91	40	71	30	232
Rate/10,000	1.6	0.7	1.4	1.0	0.9
95% CI	0.5–2.8	−0.1–1.6	0.1–2.6	0.3–1.7	0.6–1.6
Rape (E-960.1)					
n		40	71	51	162
Rate/10,000		0.7	1.4	1.7	0.8
95% CI		0.01–1.5	0.4–2.4	0.5–2.8	0.5–1.2
Total[a]					
n	232	555	1454	1586	3827
Rate/10,000	4.2	10.3	28.3	53.1	19.6
95% CI	2.3–6.0	7.2–13.4	23.0–33.7	44.0–62.1	17.4–21.8

CI = confidence interval.
[a] Row totals include other and unspecified causes of intentional injuries.

constituted 2.7% of all injury and poisoning presentations over the study year (2.7% among Jewish and 2.5% among Arab children and adolescents).

Presentations to ER

The causes of intentional injury presenting to the ER are summarized in Table 1. The majority of cases were injuries inflicted by others, with fights and assaults constituting 54.1% of the presentations and abuse and rape representing relatively smaller presentation rates. Overall, and for each cause except abuse, the rates were higher among the 10- to 17-year-olds than among younger children (aged 0 to 9 years). Most of the fights and assaults (73.3%) were the result of being struck or hit by another person, 16.0% by cutting instruments, 4.0% by burns, and 6.7% by other means. Of the abuse cases, 52.4% of injury was inflicted by being hit or struck, 23.8% by falling down, and 14.3% by burns, and in 9.5% the exact mechanism was not specified. Rape was diagnosed in children as young as 5–9 years old and the rate increased markedly for the 15 to 17 year olds. Self-inflicted injuries (attempted suicide) represented 10.8% of the total intentional injuries, with the earliest age suicide attempt being reported in the 10 to 14 age group. Increased age was associated with increased rates, and 82.9% of all attempted suicides were found among the 15 to 17 year olds. Most of the attempted suicides were by poisoning (83.8%); 10.1% were by cuts, 2.7% were caused by jumping from a height, and in 3.4% of the cases no method was specified.

The intentional injury rate for boys was 1.8 higher than for the girls (Table 2). Boys were 2.5 times more likely than the girls to present to the ER with an injury as a result of fights/assaults and 5.7 times more for abuse, whereas girls were three times more likely than the boys to present for attempted suicide and 3.3 more times for rape.

The intentional injury rate was 1.7 higher for the Jewish than for the Arab children and adolescents (Table 2). The rates were 1.5 higher for rape and abuse, and 1.6 for fights/assaults, and increased to 4.3 for suicide attempts.

The rates of ER attendance were similar for the urban and the rural populations (Table 3). For the Arab population the rate was 1.4 higher among the rural than among the urban residents.

Hospitalization

Of all the intentionally injured children and adolescents, 21.7% were hospitalized, representing 6.3% of all injury hospitalizations. Hospitalization rates are presented in Table 4.

Table 2. Causes of Intentional Injury, by Gender and Population Group

	Fight/Assault	Suicide Attempt	Abuse	Rape	Total[a]
Gender					
Boys					
n	1485	111	162	40	2464
Rate/10,000	15.2	1.1	1.7	0.4	25.2
95% CI	12.6–17.8	0.3–2.0	0.8–2.5	−0.1–0.9	21.9–28.5
Girls					
n	576	303	30	121	1283
Rate/10,000	6.2	3.3	0.3	1.3	13.8
95% CI	4.5–7.9	2.0–4.5	−0.1–0.7	0.6–2.0	16.3–11.4
Population group					
Jews					
n	1697	374	172	131	3121
Rate/10,000	11.8	2.6	1.2	0.9	21.4
95% CI	9.8–13.8	1.7–3.5	0.6–1.8	0.5–1.4	18.8–24.0
Arabs					
n	353	30	40	30	616
Rate/10,000	7.5	0.6	0.9	0.6	12.6
95% CI	4.8–10.1	−0.2–1.5	0.1–1.6	−0.1–1.4	9.2–16.1

CI = confidence interval.
[a] Total includes other and unspecified causes of intentional injuries when gender and population group were recorded.

The proportion of children and adolescents hospitalized varied by cause: 72.4% of those who attempted suicide, 39.5% of abused children, 16.1% of those who consulted after rape, and 14.9% of injured as a result of fights and assaults.

Mortality

Over the study year, 21 deaths owing to intentional injuries were recorded, giving a rate of 1.1 in 100,000 (95% CI = 0.7–1.7/100,000) or 14.1% of all the injury deaths. Mortality rates are presented in Table 4.

There were 11 cases of suicide documented and 5 in the 10–14 year age group, 7 of the 11 were boys, and none of the 11 were Arab. Methods of committing suicide were as follows: jumping (four cases), hanging (three cases), firearm use (two cases), and other methods (two cases). There were seven cases of assault leading to death (four using firearms, two using cutting and piercing instruments, and one by poisoning) and three cases of death due to terrorist action (all Jewish).

Table 3. Intentional Injuries, by Place of Residence and Population Group

	Place of Residence	
Population Group	Urban	Rural
Jews		
n	2747	343
Rate/10,000	21.8	19.8
95% CI	19.0–24.5	12.8–26.7
Arabs		
n	505	91
Rate/10,000	12.1	17.1
95% CI	8.4–15.7	5.6–28.7
Total		
n	3252	434
Rate/10,000	19.3	19.1
95% CI	17.0–21.6	13.2–25.1

CI = confidence interval. Mantel–Haenszel $p = .839$.

Ratios of Death to Hospitalization and ER Presentation

The ratios of death to hospitalizations and ER presentations are given in Table 5, using cases of death as reference. For each case of death, the number of girls hospitalized was slightly lower than for boys, but with fewer cases released from the ER. Although there were more 0- to 9-year-olds hospitalized than in other age groups, the 15- to 17-year-olds were least likely to be released from the ER for each case of death compared with other age groups. More Arab than Jewish children and adolescents were hospitalized for each case of death. For each case of suicide there were more children hospitalized than released from the ER.

International Comparisons

Table 6 presents data from other studies (13–17) in which rates for nonfatal intentional injuries were

Table 4. Hospitalizations Rates (per 10,000) and Death Rates (per 100,000), by Age, Gender, Population Group, and Place of Residence

	Hospitalization		Death	
	Rate/10,000	*p*	Rate/100,000	*p*
Total				
n	829		21	
Rate	4.3		1.1	
95% CI	3.3–5.4		0.7–1.7	
Age (yr)		.000		.000
0–9				
n	141			
Rate	1.3			
95% CI	0.5–2.0			
0–14				
n			9	
Rate			0.6	
95% CI			0.3–1.0	
10–17				
n	687			
Rate	8.5			
95% CI	6.3–10.6			
15–17				
n			12	
Rate			4.0	
95% CI			2.1–7.0	
Gender		NS		NS
Boys				
n	444		11	
Rate	4.5		1.1	
95% CI	3.0–6.1		0.6–2.0	
Girls				
n	383		10	
Rate	4.1		1.1	
95% CI	2.8–5.5		0.5–2.0	
Population group		.0001		NS
Jews				
n	657		18	
Rate	4.6			
95% CI	3.3–5.8		0.7–2.0	
Arabs				
n	172		3	
Rate	3.6		0.6	
95% CI	1.7–5.6		0.1–1.9	
Place of residence		.000		
Urban				
n	768			
Rate	4.6		Information not available	
95% CI	3.4–5.7			
Rural				
n	51			
Rate	2.2			
95% CI	0.5–4.0			

CI = confidence interval; NS = nonsignificant.

reported. These studies are based on varied sources of care and types of data collected for different age groups. The rates in Israel are apparently lower than in other studies.

Table 5. Ratio of Fatal Injuries, Hospitalizations, and Emergency Room (ER) Consultations, by Selected Variables for Each Case of Death

	Death	Hospitalization	ER	*p*
Total	1	39	143	
Gender				.000
Boys	1	39	177	
Girls	1	36	87	
Age (yr)				.000
0–9	1	51	332	
10–14	1	33	166	
15–17	1	34	94	
Population group				.004
Jews	1	36	133	
Arabs	1	54	141	
Cause				.000
Suicides	1	22	13	
Assault	1	46	245	

Discussion

This study presents information regarding intentional injuries recorded in ERs in Israel. The incidence rates for nonfatal injuries can be considered representative of intentional injuries reaching the ER. Not included in the study were two general hospitals predominantly serving the Jewish population, and three hospitals serving only the Arab population. They represent 6.5% and 5.1%, respectively, of the pediatric beds in the country (18). None of these hospitals had orthopedic, surgical, or intensive care units, and therefore were unlikely to receive cases of intentional injury involving serious injury. No weighting for missing cases was carried out because it was assumed that their inclusion, if possible, would not significantly alter the distribution of injuries described here.

In 15% of cases, the cause and circumstance of injury was not recorded or not specific enough to allow classification. Problems with injury documentation and coding have been recognized in the United States (19,20), and the Committee on Injury and Poison Prevention of the American Academy of Pediatrics has recently provided specific recommendations to improve recording and coding ER and hospitalization data (21).

Causes of Intentional Injury

Fights/assaults were found to be the most frequent cause of intentional injury presenting to the ER, as was found in a Massachusetts study (14) and in Norway (Lund, personal communication). Fatal in-

Table 6. International Comparison of Nonfatal Intentional Injuries

Place	Year	Source of Information	Age (yr)	Cause	Rate
Israel (this study)	1994	Emergency room records	10–14	Suicide	1.2/10,000
			15–17		10.8/10,000
			0–4	Assault/abuse and rape	2.4/10,000
			5–9		9.2/10,000
			10–14		18.3/10,000
			15–17		32.6/10,000
Ohio (13)	1977	Emergency room records	0–4	Assault	1/1000
			5–9		3/1000
			10–14		7/1000
Massachusetts (14)	1979–1982	Emergency room records	0–19	Self-inflicted	8.7/10,000
				Assault	65.3/10,000
				Total	76.2/10,000
Canada (15)	1990–1992	Hospitalizations	0–19	Suicide attempts	67.7/100,000
				Assault, abuse, and neglect	33.7/100,000
Nevada (16)	1991–1992	Trauma registry	0–4	Self-inflicted	0.5/100,000
			5–17		3.9/100,000
			0–4	Assault	16.3/100,000
			5–17		27.4/100,000
Eastern Massachusetts (17)	1991–1993	Harvard Community Health Plan (Primary Care) encounter reports	3–5	Intentional injuries	0.4/1000
			6–12		2/1000
			13–18		8.7/1000
			3–18		4.1/1000
Norway (Lund J, personal communication)	1995–1997	National Injury Registry of Norway (4 towns, inpatients and outpatients)	0–17	Self-inflicted	7.8/10,000
				Violence	22.3/10,000

Self-inflicted injury or suicides in the ER and hospitalizations refer to E-950-959; injuries inflicted by others refer to E-960-969, except in Ohio, where it did not include late effects E-969. In Eastern Massachusetts, intentional injuries were defined as injuries resulting from events involving two or more people and a situation of conflict, argument, abuse, or crime.

juries, as expected, were more likely to involve firearms and cutting and piercing instruments.

Suicide attempts were the second most common cause of intentional injury presenting to the ER. The differences in methods used for nonfatal versus fatal injuries found here are in accordance with the literature (10). Medicine overdose was the most frequently used method among attempted suicides; completed suicides were most commonly by firearm use or hanging. Availability of guns has consistently been found to be associated with increased rates of suicides (22–25). The ratio of attempted to completed suicides varies from 5:1 to more than 150:1 for different populations (14,26–27). The data found in our study, 35:1, are likely to underrepresent the problem because not all attempts reach the ER and not all suicides are coded as such.

Our findings for abuse are also likely to underestimate the gravity of the problem. Cases of abuse seen in hospital may represent only severe cases because parents may seek care for more serious injuries or only more serious cases may be picked up for referral by other sources (28). The number of cases of abuse in our study is lower than that reported to child protection agencies in Israel. In 1994, 1462 cases were investigated by child protection services in Israel (29), seven times more than the number of cases presenting to the ER recorded here. These cases also include reports of emotional abuse that are unlikely to present to the ER. Cross-referencing of cases between this study and those reported to the child protection service was not possible for reasons of confidentiality. However, it is well known that there is underreporting to both medical and child protection services and a clear sociocultural bias (1) in reporting. In addition, data from some registries were not released owing to issues of confidentiality. Therefore, we could not estimate the extent of abuse and potential for underreporting.

Cases of rape recorded in the ER were 14 times lower than those reported to rape crisis centers in the country for children and adolescents up to age 18 years (29). None of those figures may express the actual size of the problem. Although only selected cases may reach ER, it is estimated that between 1 and 4 in 10 or 20 cases of rape are reported (1). Stigmatization, fear, and feelings of shame or guilt may preclude rape disclosure by victims or their caretakers.

Severity

Although we did not use a specific measure of severity in this study, intentional injuries were overrepresented among hospitalized cases and those that resulted in death. Intentional injuries amounted to 2.7% of all ER injury presentations for children and adolescents. However, they were more than twice that proportion among hospitalized cases (6.3%) and 14.1% among cases of death. In a Massachusetts study (14), the respective proportions were 3.4%, 9.8%, and 15.7%, and in Canada hospitalizations and cases of death were 9.4% and 23.4%, respectively (15). In our study, girls and adolescents aged 15–17 years were identified to be at high risk for hospitalization and death.

Gender and Ethnic Differences

A clear male dominance was found among children and adolescents admitted to the ER. This was not the case in Massachusetts (14), where the male–female ratio was close to 1 (0.9:1), or in reports from child protection workers in Canada for physical abuse (1.1:1) (15). In Israel, according to child protection services (30), there was only a slight predominance of boys over girls among the physically and emotionally abused (54%). The higher male presentation to the ER in our study may reflect different victim response. Male adolescents may be more likely to respond to aggression with force, resulting in more severe injuries requiring medical attention.

The typical pattern in self-inflicted injury, i.e., higher frequency of attempted suicide among females with a male predominance among completed suicides (10), was also evident in this study. Overwhelmingly, females were the victims of reported rape. It is estimated that male rape is reported even less than female rape. The literature on rape addresses the topic mainly in female terms (1).

Ethnic differences were particularly noticeable for self-inflicted injuries. The difference in mortality rates between the Jewish and Arab child and adolescent populations can be accounted for mostly by self-inflicted injuries. There was not a single case of suicide among Arab children or adolescents in the study year. Suicide rates have been consistently higher among Jewish than Arab adolescents over the years (Gofin R, unpublished data, 1999). Ethnic differences have been shown in the United States, where white teenagers have a higher rate of suicide than black teenagers (10). In Canada, the 0- to 19-year-olds in aboriginal reserve communities were observed to have much higher suicide rates than the total population (15). In our study, patients or their families may disclose information differentially about circumstances of injury according to differing sociocultural norms and taboos. Cases may also be identified or recorded as self-inflicted injuries differentially by health professionals. Nevertheless, actual differences in youth self-inflicted injury behavior cannot be discounted.

Cases of nonfatal injuries caused by others presenting to the ER were also more frequent among Jewish than Arab children and adolescents. As for self-inflicted injuries, methodologic issues regarding identification and recording of cases may explain this difference, as well as differential care-seeking behavior. Without accurate data for these issues, the different trends between the population groups cannot be determined.

Age Group Differences

Our findings that adolescents are at higher risk than younger people for intentional nonfatal and fatal injuries compare with other populations (13,14,17). The increase with age was evident for those admitted to the ER for injuries owing to fights/assaults. This is in contrast to the fact that bullying and fighting among adolescents decrease with increasing age (3,30). This suggests that violence among older adolescents, most commonly among peers and among boys, results in more severe injuries.

As a point of interest, 61 cases of presentation to the ER as a result of fights were in the 0 to 4 year age group. Sibling and peer fights at this age are different than those of older age groups. Small children expressing their anger at a sibling or peer intend to hurt the other child but are too young to understand the potential consequences. Nevertheless, the harm caused may be severe enough or cause enough concern for parents to seek medical attention.

Suicide attempts, which start in early adolescence, present a dramatic increase among the 15- to 17-year-olds. Suicide rates before age 15 are considered uncommon but presented a relatively high frequency in our population, and are considered to be on the rise in the United States (10). Cases of rape presenting to the ER also present a clear increase from early teens, which compares to the Massachusetts population (14). Cases of abuse present the highest incidence in the 0 to 4 year age group. The increase in the early teens differs from the findings in Massachusetts, where a monotonic decrease was evident after the age of 0 to 4 years (14). A chance finding in our

population may not be discarded due to the relatively small number of cases in the sample.

Place of Residence

Intentional injuries are recognized as being mostly an urban phenomenon (14,16). However, in our study there were no differences among the urban and rural children and adolescents in presentations to the ER, although among the Arabs the rate was higher among rural than urban populations. This finding requires further study vis-á-vis risk behavior of youngsters, pattern and characteristics of the injury, pattern of use of services, and availability and accessibility of primary and emergency care.

International Comparisons

Comparisons of nonfatal intentional injuries with other studies are limited by the different types and representation of populations covered, methods of data gathering, selection of age groups, and causes reported. In addition, care-seeking behavior and availability and accessibility of ERs to the different populations may limit comparisons. Although no conclusions can be reached from these comparisons, the apparent lower rates in Israel with respect to other countries deserve further study. In Israel, for example, there is a high level of environmental tension and stress. In addition, there is widespread possession of firearms among the population in general, and among young adults in particular, because of compulsory army service for all 18 to 21 year olds and reserve duty for the adult male population. Cross-country studies using similar methodology comparing exposure to guns, and social and cultural factors related to use of firearms and violence in general could provide evidence regarding these issues and directions for prevention.

In conclusion, self-inflicted and intentionally inflicted injury are a relatively small proportion of all injuries presenting to the ER. However, their severity is greater than nonintentional injuries, as attested to by the higher proportion of hospitalizations and cases of death among these groups. Adolescents from the age of 10 years are at higher risk than are younger children. Intentional injuries presenting to the ER are only an indicator of the problem of violence, because not all injured youth seek medical attention and not all are identified. This intensifies the notion that for each case that comes to the attention of a health service many more go unidentified and hence will not receive adequate care. Recognition of the problem by health care workers also requires accurate information to be elicited and recorded. This will enable better evaluation and planning of activities at all levels of care.

This study was funded by grants from the Israel Council for Children and from the Israel Ministry of Health.

References

1. Injury prevention: Meeting the challenge. Am J Prev Med (Suppl. 5). 1989: Chapters 10, 11, 12, and 15.
2. McDevitt S. The impact of news media on child abuse reporting. Child Abuse Neglect 1996;20:261–74.
3. King A, Wold B, Tudor-Smith C, Harel Y. The Health of youth. A cross-national survey. European Series no. 69. World Health Organization, 1996.
4. The Division of Injury Control, National Center for Environmental Health and Injury Control; Division of Adolescent and School Health. National Center for Chronic Diseases, Prevention and Health Promotion, CDC. Physical fighting among high school students—United States, 1990. JAMA 1992;267:3009–10.
5. Moore J, Campana J, Lam M, et al. Behaviors related to unintentional, intentional injuries, high school students—United States, 1991. JAMA 1992;268:2495–8.
6. Youth Risk Behavior Surveillance—United States, 1997. MMWR Morb Mort Wkly Rep 1998;47:N0.SS-3.
7. Kachur SP, Stennies GM, Powell KE, et al. School-associated violent deaths in the United States, 1992 to 1994. JAMA 1996;275:1729–33.
8. Newberger EH. Child abuse. In: Last J, Wallace RB, eds. Public Health and Preventive Medicine, 13th ed. London, UK: Prentice Hall International, 1992:1046–8.
9. Vandeven AM, Newberger EH. Child abuse. Annu Rev Public Health 1994;15:367–9.
10. Kachur SP, Potter LB, Powell KE, Rosenberg ML. Suicide: epidemiology, prevention, treatment. Adolesc Med 1995;6: 171–82.
11. Statistical Abstract of Israel 1995. No. 46. Central Bureau of Statistics. Jerusalem, Israel.
12. World Health Organization (WHO). International classification of diseases, 9th revision. Geneva: WHO, 1976.
13. Fife D, Baranick JI, Chaterjee BF. Northestern Ohio Trauma Study. II. Injury rates by age, sex and cause. Am J Public Health 1984;74:473–8.
14. Guyer B, Lescohier I, Gallagher SS, et al. Intentional injuries among children and adolescents in Massachusetts. N Engl J Med 1989;321:1584–9.
15. Ministry of Public Works and Government Services. For the safety of Canadian children and youth. Canada, 1997: Chapters 1 and 2.
16. Niemcryk SJ, Hines R, Brawley M, Yount SI. Intentional and unintentional injury in the State of Nevada: 1989–92. Am J Prev Med 1998;14:43–53.
17. Sege R, Stigol LC, Perry C, et al. Intentional injury surveillance in a primary care pediatric setting. Arch Pediatr Adolesc Med 1996;150:277–83.
18. Hospitals and day care units. 1994. Health and Computer Services. Ministry of Health, Israel, 1995.
19. Schwartz RJ, Boisoneay D, Jacobs LM. The quantity of causes of injury information documented in the medical

record: An appeal for injury prevention. Accid Emerg Med 1995;2:98–103.

20. Langlois JA, Buechner JS, O'Connor EA, et al. Improving the E-coding of hospitalizations for injury: Do hospital records contain adequate documentation? Am J Public Health 1995;85: 1261–5.
21. American Academy of Pediatrics. Committee on Injury and Poison Prevention. The hospital record of the injured child and the need for External Cause-of-Injury codes. Pediatrics 1999;103:524–6.
22. Kellerman AL, Rivara FP, Somes G, et al. Suicide in the home in relation to gun ownership. N Engl J Med 1992;327: 467–72.
23. Loftin C, McDowall D, Wiersema B, Cottey TJ. Effects of restrictive licensing of handguns on homicide and suicide in the District of Colombia. N Engl J Med 1991;325:1615–20.
24. Brent DA, Perper JA, Allman CJ, et al. The presence and accessibility of firearms in the homes of adolescent suicides. JAMA 1991;266;2989–95.
25. Killias M. International correlates between gun ownership and rates of homicide and suicide. Can Med Assoc J 1993;148: 1721–5.
26. Rosenberg ML, Gelles RJ, Holinger PC, et al. Violence: Homicide, assault and suicide. In: Amler RW, Dull HB, eds. Closing the Gap: The Burden of Unnecessary Illness. New York: Oxford University Press, 1987:164–78.
27. McIntire MS, Angle CR, Schlicht ML. Suicide and self poisoning in pediatrics. Adv Pediatr 1977;24:291–309.
28. Johnson CF. Inflicted injury versus accidental injury. Pediatr Clin N Am 1990;37:791–814.
29. The State of the Child. National Council for Children, Jerusalem, 1996.
30. Kann L, Warren CW, Harris WA, et al. Youth Risk Behavior Surveillance—United States, 1993. MMWR 44/No. SS-1.