

Determinants of assault-related violence in the community: potential for public health interventions in hospitals

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ABSTRACT

Background Data from emergency departments (EDs) in England describe the epidemiology of violent assaults. However, the potential of such data to inform hospital-based public health interventions remains unknown.

Objective To identify determinants of assaults using ED data to inform development of programmes delivered in acute Trusts for reducing assault-related injuries in the community.

Methods Data were collected from a large North London acute Trust on assault-related injuries reporting to A&E over 18 months (July 2010–February 2012). Information was recorded on patient demographics and assaults (place of assault, type of assault, relation to assailant) through questionnaires administered by ED reception staff.

Results 1210 assaults were recorded between July 2010 and February 2012. 18% of assaults were severe (strangling, stabbings, sexual assaults). 75% of assault victims were men, 37% were young adults (20–30 years) and 15% were teenagers. A higher proportion of victims lived in more deprived areas. Apart from public streets (48%), the main location of assaults was at home (20%). Female compared with male victims were significantly more likely to be both assaulted at home (OR 6.13; 95% CI 4.41 to 8.54) and to be assaulted by a known assailant (family member, friend, partner/ex-partner; OR 8.20, 95% CI 5.85 to 11.48).

Conclusions The results highlight the notable contribution of domestic violence to assaults presenting to hospital ED. Such findings can be used to plan interventions such as screening hospital patients for domestic violence. ED data have the potential to inform hospital-based initiatives to address issues such as assaults in the local population.

over the year (equivalent to an estimated 1.2 million female and 800 000 male victims).¹ Reducing violent crimes and physical abuse forms an important part of ensuring a safe living environment and the Department of Health publication *Healthier, Fairer, and Safer Communities (2008)* provides a framework for a joined up approach to address the root causes of violence focusing on early prevention and addressing factors that increase the risk of violence in populations.²

Evidence has shown that hospitals can contribute effectively to violence prevention by working in partnership with local crime and disorder reduction partnerships.^{4–6} Studies have shown that assaults reporting to emergency departments (EDs) are under-reported to the police.^{7–9} Initiatives in England and Wales to share anonymised data on assaults (eg, the location of violent incidents) have helped police target ‘hot spot’ areas resulting in reduced violence and related attendances by about 30% in EDs in Cardiff, Cambridge and Wirral area in North West England;^{4–6} the effectiveness of one such initiative has also been reported.⁵ The Coalition Commitment Programme was launched by the Department of Health to enable sharing of information between hospitals and the local police to reduce violence-related health and social consequences.¹⁰ The College of Emergency Medicine has also published guidance on the collection of violence-related data in hospital EDs.¹¹ Nevertheless, the potential of such data to inform development of hospital-based strategies to reduce violence in the local population remains unknown. In this study, we aimed to identify determinants of violence/assaults attending the ED of a large acute hospital in London to inform hospital-based prevention strategies to address the issue of violent assaults in the local population.

INTRODUCTION

Violence and physical abuse have a significant impact on the health and well-being of individuals. The Crime Survey for England and Wales in 2011–12 reported 2.1 million violent incidents with 3% adults affected.¹ Apart from immediate consequences such as physical injuries, violence impacts on a range of short-term and long-term outcomes such as antisocial behaviour, emotional and mental health problems (particularly in children) and sexually transmitted diseases.^{2–3} Almost half of all violence-related crimes are reported to be alcohol-related.¹ Domestic violence also contributes significantly to assault-related injuries with the Crime Survey for England and Wales in 2011–12 reporting that 7% of women and 5% of men were estimated to have experienced some form of domestic abuse

METHODS

The Royal Free Hospital is a large acute hospital in North London with a catchment area that serves the population of six north London boroughs (Barnet, Camden, Islington, Haringey, west Enfield and east Brent). The ED provides emergency medical service 24 h a day. A total of 93 285 attendances were reported in the ED between 2012 and 2013.

In an effort to reduce alcohol-related violence in the local community, the Royal Free Hospital was asked to work in conjunction with the local Community Safety Partnership which are statutory bodies comprising the local Council, the local police and police authority and the Government Office for London to collect data on assaults

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attending the accident and emergency (A&E) department. Our data sharing model was based on that implemented in 2009 in Cardiff¹² to collect information on assault-related injuries presenting to the hospital ED. At the time of reporting to the ED, individuals with an assault injury were identified by ED reception staff through an initial enquiry and were asked to complete a self-administered paper-based questionnaire (for those under 18 years, the questionnaire was completed, where possible by the parent/guardian). The questionnaire recorded demographic details of the victim, nature of the assault, location of the assault, demographic details of assailants and the victim's relationship to assailants. It was also possible through this model to identify repeat attenders at ED. No patient identifiable information was collected in the questionnaire and all data were used in non-identifiable format to maintain confidentiality throughout. We used these data routinely collected in the ED for the analyses. Ethical approval for data analysis and publication was obtained from the research ethics committee (reference 12/SC/0377).

Victims were asked in the questionnaire if they had consumed alcohol prior to the assault and this was used as a proxy measure of alcohol-related assaults. Socioeconomic deprivation was based on the Index of Multiple Deprivation (IMD) 2010 score at lower super output area (LSOA) level for the victims as determined by their postcode of residence. This was obtained from the Department for Communities and Local Government website (<http://www.communities.gov.uk>). LSOAs are geographical areas with an average population size of 1500 individuals. The national IMD ranks were divided into quintiles and applied to the LSOAs for participants in the analysis.

Statistical analyses: We first examined descriptive/demographic characteristics of the study population presented as proportions. To estimate relative risks, prevalence ratios and 95% CIs were calculated for locations of assault and relation to assailants according to gender (female victims as the reference group). Gender was fitted as a categorical variable. All analyses were carried out using SAS statistical software V.9.2.

RESULTS

Overall, 1210 assaults were recorded through this initiative in A&E between July 2010 and February 2012. This represents a 74% response rate (a total of 1632 patients were recorded in the Hospital ED's dataset with 'assault' recorded in the presenting complaint or diagnosis fields). Most victims (75%, n=905) presented to the ED within 24 h of the assault. Table 1 documents the different types of assaults; 19% were severe including strangling, stabbing, sexual assaults, victim pushed through door/window, and assaults with glass/bottle or firearms/explosives. Overall, 48% of assaults were carried out by two or more

assailants. The assailants were mostly male (86%) and 19% were aged less than 20 years. Of the total assaults, 3% (n=41) were repeat assaults within this study period on the same victim.

Table 2 presents sociodemographic characteristics of the victims of assaults. Most victims were male (75%). The highest proportion were young adults aged 20–29 years (38%) followed by those aged 30–39 years (22%); 15% of victims were teenagers (15–19 years). In all, 53% were of white British or white other ethnicity (the estimated proportion of white ethnic groups in the catchment area of the hospital is 63% based on 2011 Greater London Authority population estimates). Based on IMD quintiles, only 4% of victims came from the least deprived area while 64% lived in the most deprived areas.

Over half (55%, 474/866) of the victims reported that they have consumed alcohol before the assault. A higher proportion of male (59%) compared with female victims (41%) reported alcohol-related assaults. Victims aged 20–59 years reported a higher proportion of alcohol-related assaults compared with those aged 15–19 years (figure 1).

Most assaults were reported to have taken place on the street (48%) while 20% took place at home (either the victim's or assailant's) (table 3). Female compared with male victims were more likely to be assaulted at home (44% compared with 12%, prevalence ratio 3.79; 95% CI 2.99 to 4.80; $p < 0.0001$). Female victims were less likely to be assaulted in bars/clubs and on the street compared with men.

Table 2 Demographic characteristics of assault victims reported during an 18-month period

Gender	
Male	857 (75%)
Female	282 (25%)
Total (missing n=71)	1139 (100%)
Age groups	
0–14	28 (2.5%)
15–19	176 (15%)
20–29	433 (38%)
30–39	249 (22%)
40–59	211 (19%)
60+	43 (4%)
Total (missing n=70)	1140 (100%)
Ethnicity	
White British Irish	426 (35%)
White Other	217 (18%)
Asian or Asian British	128 (11%)
Black/Black British Caribbean Other	112 (9%)
Mixed Other	16 (1%)
Mixed White Black Caribbean	9 (0.7%)
Chinese	5 (0.4%)
Mixed White Asian	4 (0.3%)
Not known	182 (15%)
Other ethnic group	111 (9%)
Total	1210 (100%)
Socioeconomic deprivation—Index of Multiple Deprivation quintiles	
1 (least deprived)	40 (4%)
2	146 (14%)
3	208 (19%)
4	351 (33%)
5 (most deprived)	330 (31%)
Total (missing n=135)	1075 (100%)

Table 1 Type of assaults reported

Punched/pushed/slapped/kicked/blunt object	869 (75%)
Strangled	42 (4%)
Bitten	11 (1%)
Glass/bottle injury	98 (8%)
Knife/bladed object	47 (4%)
Pushed through door/window	7 (0.6%)
Firearms/explosives	3 (0.3%)
Sexual assault	13 (1%)
Other	76 (7%)
Total (missing n=44)	1166 (100%)

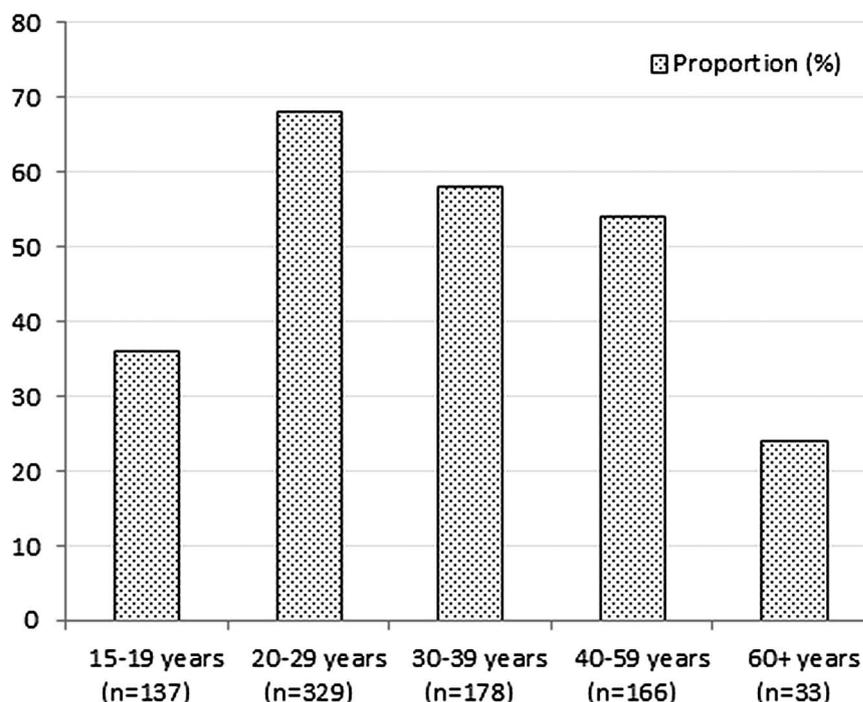
Figure 1 Alcohol-related assaults according to age groups of victims.

Table 3 also shows the relationship of the assailant to the victim and the distribution according to gender. Overall, 21% of victims were assaulted by a known assailant (family member, partner/ex-partner or friend). Female compared with male victims were more likely to be assaulted by a known assailant (prevalence ratio 4.34; 95% CI 3.45 to 5.48; $p < 0.0001$) and were less likely to be assaulted by a stranger (table 3). In all, 9% of victims (n=71) reported to having ever been previously assaulted by the same assailant. A greater proportion of female compared with male victims reported a previous assault by the same assailant (28% (n=48) women compared with 4% (n=21) men, p value = < 0.0001).

DISCUSSION

The specific purpose of this study was to identify determinants of assaults reported in a hospital ED, which could then be used to inform hospital-based public health initiatives to address

assaults in the local population. We demonstrated through a review of these data the notable contribution of domestic violence towards women to overall assault. We found that a fifth of assaults occurred at home and that women were significantly more likely than men to be assaulted in their own home. Women were also four times more likely to be assaulted by a known assailant (family member, partner/ex-partner) than men. These findings of domestic violence led to inform the planning of an initiative for domestic violence screening in the hospital.

We also found that overall, three-quarters of victims were male, over half were of white ethnicity and that victims were more likely to live in economically deprived areas. The highest proportion of victims overall were young adults aged 20–29 years. We also found that over half of victims reported to have consumed alcohol before the assault, and that men were more likely to have alcohol-related assaults compared with women. This epidemiology of assaults in our population

Table 3 Location of assault and relation of victim to assailant by gender

	All (%)	Female (%)	Male (%)	Prevalence ratio (95% CI) female to male victims
Location of assault				
Home (victim's/assailant's)	218 (20)	119 (44)	90 (12)	3.79 (2.99 to 4.80)
Bar/club	135 (12)	19 (7)	103 (14)	0.53 (0.33 to 0.85)
Street	526 (48)	85 (32)	416 (55)	0.59 (0.49 to 0.71)
Indoor public place	33 (3)	7 (3)	22 (3)	0.91 (0.39 to 2.11)
Public park/open spaces	78 (7)	14 (5)	62 (8)	0.65 (0.37 to 1.14)
School/workplace	63 (6)	15 (6)	47 (6)	0.92 (0.52 to 1.61)
Transport	35 (3)	7 (3)	23 (3)	0.87 (0.37 to 2.01)
Total (missing n=122)	1088 (100)	266 (100)	763 (100)	–
Relation of victim to assailant				
Known (partner/ex-partner, family, friend/acquaintance)	229 (21)	128 (49)	88 (11)	4.34 (3.45 to 5.48)
Stranger	566 (52)	82 (32)	458 (59)	0.54 (0.44 to 0.65)
Unknown	270 (25)	39 (15)	208 (27)	0.56 (0.41 to 0.77)
Work client/customer	31 (3)	10 (4)	20 (3)	1.49 (0.71 to 3.15)
Total (missing n=114)	1096 (100)	259 (100)	774 (100)	–

matches that previously known with a greater risk reported among men, lower socioeconomic groups and younger age groups.^{1 13 14} Similar to previously described joint working initiatives, ongoing collaborations exist between the hospital and the local Community Safety Partnership to plan prevention strategies for overall reduction of violence in the community; hospital ED data have been used by the local police as part of these initiatives outside the hospital.

However, the specific focus of this paper was to understand whether the ED data can be used for hospital-based initiatives to reduce violence-related crimes in the community. The notable contribution of domestic violence to assaults attending our ED led us to implement an intervention to screen patients for domestic violence in key services within the Trust and to then signpost them to local organisations for support. The study also reflects that the hospital was a point of contact with patients affected by assaults and it offers an opportunistic and safe environment for initiatives such as screening for domestic violence. With women being more likely to be victims of assault at home and to know their assailant, there was a specific focus on hospital clinics providing services to women. The screening intervention and signposting patients was, therefore, initiated in specific clinics including community gynaecology, maternity services and sexual health clinic and is now being rolled out across the Trust.

The study also has limitations. While the survey was aimed at including all patients presenting to the ED with assaults, it is inevitable that the more severely injured and those under a stronger influence of alcohol were unable to participate in the survey. Although the survey achieved a 74% response rate, it is possible that assaults, particularly related to sensitive issues like domestic violence, were under-reported. The number of patients who were unable to participate in the survey was not systematically recorded during the survey. We were, therefore, unable to identify a reliable denominator to assess response rates to the survey. Missing information on more severe injuries would also have resulted in an underestimation of the severity of assaults reported in this study. The initiative used a paper-based data collection system, which may have also contributed to the incompleteness of the data and technical difficulties in linkage with routine ED data. Furthermore, we were unable to fully explore the contribution of alcohol consumption to assaults. A proxy measure available for alcohol-related assaults was whether the victim consumed alcohol; information on whether the assailant consumed alcohol was not available.

It is known from previous studies that assaults, particularly domestic violence, are under-reported to agencies such as the police.^{7–9} Hospitals, therefore, can provide excellent opportunities as a safe environment for targeted interventions to address public health issues such as assaults. We have shown that hospital data can be used to inform and implement initiatives to address public health issues such as assaults in the local population. Understanding specific determinants of assaults can be

used to implement brief interventions in specific areas such as domestic violence to maximise the opportunity of contact with patients in hospital.

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Competing interests None.

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Ethics approval Ethical approval for data analysis and publication was obtained from the local research ethics committee (reference 12/SC/0377).

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REFERENCES

- Office for National Statistics. Focus on: Violent Crime and Sexual Offences, 2011/12. *Statistical Bulletin*; 2013.
- Department of Health. Towards healthier, fairer and safer communities—connecting people to prevent violence: a Framework for Violence and Abuse Prevention. 2008.
- Shepherd JP, Bellis MA, Hughes K. *Alcohol and Violence*. Faculty of Public Health, 2005.
- Boyle AA, Snelling K, White L, *et al*. External validation of the Cardiff model of information sharing to reduce community violence: natural experiment. *Emerg Med J* 2012;59:909–10.
- Curtis F, Jonathan S, Iain B, *et al*. Effectiveness of anonymised information sharing and use in health service, police, and local government partnership for preventing violence related injury: experimental study and time series analysis. *BMJ* 2011;342:d3313.
- Quigg Z, Hughes K, Bellis MA. Data sharing for prevention: a case study in the development of a comprehensive emergency department injury surveillance system and its use in preventing violence and alcohol-related harms. *Inj Prev* 2012;18:315–20.
- Boyle A, Kirkbride J, Jones P. Record linkage of domestic assault victims between an emergency department and the police. *J Epidemiol Community Health* 2005;59:909–10.
- Faergemann C, Lauritsen JM, Brink O, *et al*. The epidemiology of repeat contacts with an Emergency Department or an Institute of Forensic Medicine due to violent victimization in a Danish urban population. *J Forensic Leg Med* 2007;14:333–9.
- Sutherland I, Sivarajasingam V, Shepherd JP. Recording of community violence by medical and police services. *Inj Prev* 2002;8:246–7.
- Department of Health. Information Sharing to Tackle Violence: Guidance for Community Safety Partnerships on engaging with the NHS. 2012.
- Boyle A, Jonathan S, Sheehan D. *Guideline for information sharing to reduce community violence*. London: The College of Emergency Medicine, 2012.
- Warburton AL, Shepherd JP. Tackling alcohol related violence in city centres: effect of emergency medicine and police intervention. *Emerg Med J* 2006;23:12–7.
- Howe A, Crilly M. Deprivation and violence in the community: a perspective from a UK Accident and Emergency Department. *Injury* 2001;32:349–51.
- Sivarajasingam V, Morgan P, Matthews K, *et al*. Trends in violence in England and Wales 2000–2004: An accident and emergency perspective. *Injury* 2009;40:820–5.



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