When the Cats are away: The impact of sporting events on assault- and alcohol-related emergency department attendances

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Abstract

Introduction and Aims. Despite the attention given to the broad topic of alcohol and violence, there are few studies of this relationship in the context of sporting events and their impact on alcohol-related hospital emergency department (ED) attendances, none of which are Australian. Methods. De-identified patient records from Barwon Health’s Geelong Hospital ED were analysed from 1 July 2005 to 16 February 2010. Information contained in these records included age, gender, suburb of residence, attendance date and time, arrival mode and reason for attendance. The ED triage database was searched for attendances relating to alcohol, drugs and assault of which 16,940 cases were returned. Results. There was a substantial increase in annual alcohol-related ED attendances from 2006 to 2009. Hierarchical binary logistic regression analyses showed that having a game on a particular day did not contribute to the model, but there were significantly more ED attendances for assaults on days when the Geelong Cats won. There were no significant predictors of ED attendance for alcohol-related harm in the variables studied. Discussion. The findings of the study suggest that there are significantly more assault-related attendances at the ED in Geelong when the local national football team, the Geelong Cats, won. None of the variables under investigation appears to have impacted on alcohol-related attendances which were not assaults (i.e. injuries or intoxication). Conclusions. It appears that increases in ED attendances associated with the success of a local sporting team are not significantly associated with alcohol use and are more influenced by other factors. [Miller P, McDonald L, McKenzie S, O’Brien K, Staiger P. When the Cats are away: The impact of sporting events on assault- and alcohol-related emergency department attendances. Drug Alcohol Rev 2013;32:31–38]

Key words: alcohol, sporting event, emergency department, assault, injury.

Introduction

Alcohol misuse costs the Australian community approximately 15.3 billion dollars each year and the human cost is far greater [1]. Despite the attention given to the broad topic of alcohol and violence, there are few studies of this relationship in the context of sporting events and their impact on alcohol-related hospital emergency department (ED) attendances, none of which are Australian. In light of this, the current study will investigate the relationship between alcohol and sporting events, as measured by the number of ED attendances for alcohol-related injuries.

Level of consumption

Alcohol consumption and more specifically binge drinking (normally defined as 5 or more drinks in one sitting) has been linked to special occasions such as birthday celebrations, St. Patrick’s Day and New Year’s Eve [2,3]. These specific occasions only appear on the calendar once a year, whereas a sporting event such as a football match generally takes place once a week for the sporting season. A correlation between excessive alcohol consumption and sporting events has been established by several North American studies [4]. For example, Wolfe et al. [5] found that 8.4% of 729 malespectators at a major league baseball game...
recorded blood alcohol levels at or above the legal limit of 0.08% for driving a motor vehicle. Similarly, Neal et al. [6] found that more than eight times as many students consumed alcohol on days of sporting events (National College Athletic Association Basketball Championships tournament) than on an average day.

Counter intuitively, whether games are played home or away appears not to influence alcohol consumption. Neal and Fromme [7] found that compared with typical Saturdays, alcohol consumption was greater on collegiate sports game days, with no differentiation between home or away games [7]. They posit that although alcohol may still be available, supporters attending a home game may be moderately protected by the standards of behaviour enforced at an organised event [7]. On the other hand, away games are possibly watched on television with groups of friends at a bar or a party where alcohol is more freely available, and subsequently with fewer restrictions on behaviour which may become alcohol related.

The outcome of a sporting match has also been found to change alcohol consumption and levels of harm [8]. Sivarajasingam et al. [9] found that the outcome of a sporting match was associated with increased frequency of injury resulting in ED treatment. Specifically, winning resulted in more injury than losing. Data relating to injury were collected from the Cardiff ED over the years 1995–2002. The results showed that the outcome of the match was significantly linked with assault-related ED attendances. When the result was a positive one, there were more injury-related ED attendances.

Mazur [10] suggests there is a link between rising testosterone levels and dominance, where dominance may be demonstrated by changes in posture, eye contact and assertive speech. The outcome of a sporting match has also been reported to change levels of testosterone among sports fans [11]. In studies conducted by Bernhardt et al. [11], all participants provided samples of saliva before and after a game. In both studies, levels of testosterone increased in the fans of winning teams and decreased in fans of losing teams.

Similarly, Moore et al. [12] found that the aggression of the supporters increased with the success of the team, as well as the interesting finding that it was the aggression rather than the celebration that increased levels of alcohol consumption after the match [12]. Sivarajasingham et al. [13] investigated the potential risk factors for violence-related injury, one of which was major sporting events. Data from 58 EDs in England and Wales were examined for a 5-year period, and it was found that violent injury was more frequent on days when there was a major sporting event, compared with days when there was not [13]. National sporting events draw large numbers of people into small licensed venues, or to other places where sport can be watched. It appears that social contact is increased as a consequence and supporters of both teams take part in heavy binge drinking, which in turn will increase the risk of violence.

The present study will investigate whether sporting events have an impact on assault- and alcohol-related attendances in a regional ED of Geelong hospital. Geelong is a regional city in Australia which is home to a single Australian Football League (AFL) team, the Geelong Cats. Since 2007 the Cats have had much success, winning 87% of their games, including two premierships during the study period (2007/2009). The dominance of the Cats has had an enormous impact on the culture in Geelong, which makes it an ideal site to conduct this research. This study will investigate the relationship between alcohol-related attendances (including assaults) and home/away games, wins/losses and game days versus non-game days.

Method

Barwon Health’s Geelong Hospital ED de-identified patient records were analysed from 1 July 2005 to 16 February 2010. Information contained in the de-identified patient records included age, gender, suburb of residence, attendance date and time, arrival mode and reason for attendance. Socio-economic status of ED attendances was obtained using the suburb of residence by consulting the Victorian Government site of SEIFA Index of Relative Socioeconomic Disadvantage, 2006. The ED triage database was searched for attendances relating to alcohol, drugs and assault of which 16 940 cases were returned. Refer to Appendix A for search words. These 16 940 cases were then categorised into 24 primary reasons for attendance (refer to Appendix B). Following categorisation, 7446 cases were eliminated as they did not correspond with the above categories, leaving 9494 cases which were recoded into SPSS.

Throughout the 5-year period covered in the analysis the Geelong Football club played 36 home games in Geelong, 29 of which they won, 6 of which they lost and 1 which was a draw. The season fixtures for 2005–2009 containing match outcomes were obtained from official AFL statistics. Each case was also placed into categories for ‘alcohol hours’, depending on the time at ED attendance. Rumbold et al. [14] identified three categories of alcohol hours: ‘high alcohol hours’: Fridays/Saturdays 8 PM to 6 AM, ‘medium alcohol hours’: Sunday to Thursday 8 PM to 6 AM, ‘low alcohol hours’: all days 6 AM to 8 PM. For the purpose of this study, game day includes the day of the game until midday the following day.

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All records at the Geelong Hospital ED are fully computerised and clinician notes include any mention of alcohol or no alcohol as well as all other clinical information. Patients are normally asked to self-report any alcohol or drug use as a part of standard clinical care. Clinicians also note any other signs of alcohol or drug use in these notes. The records used in this study searched all record fields and trained research assistants then read each de-identified case file to ascertain if the case was indeed alcohol or drug related. Most cases reviewed were not included as the mention of alcohol was incidental, e.g. ‘no alcohol used’. Breathalyzer readings and drug alcohol tests are not routinely conducted.

Statistical analysis

Reasons for attending ED and assaults were dichotomised into alcohol present or absent. Assumptions of random sampling consisting of independence of observation and size of expected frequencies were met prior to the analyses. Hierarchical logistic regressions were used to analyse the relationship between alcohol-related ED attendances and assaults for Geelong home or away match, win or loss, and game day versus non-game day. Finals games were removed from the analysis. Non-game days refers to weekends outside of the football season during the months of October, November and March, and non-game days during the football season which runs from April to September. Summer (December to February) was excluded due to the prevalence of non-sporting events such as New Year’s Eve that may increase alcohol-related ED attendance and assault.

Results

Preliminary analysis and assumption testing

Preliminary analyses included an inspection for missing data, outliers and that the statistical assumptions of normality were met.

Demographics

Over the period from 1 July 2005 to 16 February 2010, there were 9494 cases presented to the Geelong Hospital ED for alcohol-related reasons, ranging in age from 13 to 96 years. The mean age was 35.96 years and the mode age was 20 years. The 13–24 age category had the highest frequency \( (n = 3220) \) of 33.9\%, while the 25–34 age category had the next highest \( (n = 2001) \) at 21.1\%. It was more common for men \( (n = 6126) \) to attend the ED for alcohol-related reasons, attending 64.5\% of the time compared with women \( (n = 3368) \) attending 35.5\% of the time.

There has been a substantial increase in the number of annual alcohol-related attendances over the past 5 years; specifically, from 2006 to 2009 there was an increase of 2136 alcohol-related ED attendances. The frequencies for 1 July 2005 to 16 February 2010 are illustrated in Table 1.

Table 2 presents the frequencies for ED attendances broken into variables of interest. Overall, 1012 cases were relevant for the home/away variable, 4609 for the game/no game variable and 1002 case were valid for the win/loss category (draws were excluded).

Logistic regression models

Hierarchical binary logistic regression analyses were performed to test the level and significance of variance explained on the criterion variables: (i) ED attendance for alcohol-related reasons and (ii) alcohol-related assaults. Controlling for gender, socioeconomic status (SES) and age, the predictor variables included in the model were: (i) game day (yes, no); (ii) match outcome (win, loss); and (iii) game location (home, away). Age, gender and SES were included in the first block. Whether or not a game was played (game day) did not contribute to the model, but there were significantly more ED attendances for assaults on days when the Cats won in comparison to days when they lost. Game location and whether they played or not add to the \( R^2 \).

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The results presented in Table 4 reveal that there were no significant predictors of ED attendance for alcohol-related harm in the variables studied. Further, the model explained a very small amount of the variance.

**Discussion**

This study has found mixed trends in ED attendances for assault- and alcohol-related harm in relation to sporting events. There was no significant impact on ED attendances on any form of alcohol-related harm when Geelong played at home or away, or for whether Geelong played on that day. However, it was found that people were more likely to attend the ED as the result of an assault when the Geelong Cats won, although this effect was not observed for alcohol-related injury.

**The effect of home and away games on ED attendance**

There was no difference in the proportion of ED attendances for alcohol-related reasons and assault...
between home games and away games, which is inconsistent with past research [7]. One way to explain the results of the present study is that the teams in the AFL with large membership numbers never play in Geelong because of the restrictions in the capacity of the stadium. Geelong mostly plays interstate teams and teams with a lower support base and therefore there are less opposition team supporters at the home games, and subsequently less crowds.

The effect of match outcome on ED attendance

The hypothesis that match outcome would affect ED attendance for assault was supported, but it was not supported for alcohol-related ED attendances or for injury only. When controlling for other variables, it was found that people were 1.39 times more likely to attend the ED as the result of an assault when the Geelong Cats won. These findings are consistent with those of past research [9,12], which found that when Welsh national rugby and soccer teams won their games, ED attendances for assault- and alcohol-related harm increased. Winning has also been found to increase levels of testosterone [11], which has been related to subsequent aggression and injury.

An alternative hypothesis can be drawn from the substantive literature on the relationship between high, but unstable and shallow, self-esteem [15–23]. This body of work has demonstrated how people with artificially high self-esteem (and narcissism), but generally low implicit self-esteem, are more likely to engage in violence, particularly when they perceive their social standing to be under threat [21,23]. This false self-esteem is normally attained through external means, one of which may be the association with a sporting team. Further, people with the low self-esteem become emboldened and aggressive when they have a big boost in self-esteem, e.g. after a victory through their team. This is an inherently weak non-internally generated self-esteem. Baumeister et al. [22] found that violent people are often marked by strongly held views of their own superiority. They report that when groups of people differ in self-esteem, the group with the higher self-esteem is generally the more violent one. Most relevant, when this self-esteem rises or falls as a by-product of other events (such as the success of a sporting team), aggressive tendencies tend to be displayed. Put more simply, a proportion of supporters of successful teams become more violent if they have a low implicit self-esteem which is artificially inflated by their association with the sporting club [22]. It is also worth noting that alcohol intoxication has been shown to boost self-esteem temporarily, and it also boosts aggressive tendencies [23]. These findings suggest further research is warranted into the nature of sporting supporters and how their affiliations might be directed more positively.

The effect of game days on ED attendance

The results indicated that an individual is no more likely to attend the ED for alcohol-related reasons or an assault on a game day compared with a non-game day. This finding is inconsistent with that of Neal and Fromme [7], who found that alcohol consumption was greater on games days (collegiate sports), than non-game days. There was also a substantial spike in attendances at the ED on 2007 (n = 29), 2008 (n = 41) and 2009 (n = 37) grand final days when Geelong played in the grand final. While the highest ED attendance occurred in the year Geelong lost the grand final, 2008, the difference between that and 2009 is negligible and the difference between winning a championship and coming second may not be significant in the subsequent atmosphere around the night-time economy. Certainly, the very large number of people attending the night-time economy means that there are likely to be more violent incidents regardless of whether the night was football-related or not. Another explanation for no major effect of the days when AFL games are played is that local football is also played each weekend, resulting in large numbers of ED attendances, particularly in 2009 (n = 35) after the local league grand final where celebrations resulted in the death of one of the players; both combatants were heavily intoxicated [24].

Limitations

The main limitation of this study is that data from an ED under-represents the true level of alcohol-related injury [25]. In terms of the assault cases, it was not clear whether an individual was a victim, perpetrator or mutual participant who may have been associated with alcohol. There is the potential that aggression involving mutual participants is more likely to involve alcohol than apparent victims or perpetrators [26]. This assumption is based primarily on the reality that injuries sustained as a result of alcohol intoxication do not always require medical attention and are seldom reported to the police. It is also worth noting that the patients’ blood alcohol level may have decreased to undetectable levels by the time they received medical treatment or that the medical providers may have been unaware of any alcohol or drug usage by the patients. Further, ED data are recorded by medical staff whose main objective is patient assessment and immediate treatment, rather than noting any alcohol involvement. However, it may be speculated that the
low recording of alcohol use is consistent over time, and therefore does not present a major issue for the current study.

**Conclusion**

In line with previous research, the findings of the study suggest that there are significantly more assault-related attendances at the ED in Geelong when the local AFL team won. However, there was no significant difference between days when the Cats played and when they did not, nor whether they played at home or away. None of the variables under investigation appears to have impacted on alcohol-related attendances which were not assaults (i.e. injuries or intoxication). Understanding how sport impacts on alcohol-related harm remains an important topic and further research should investigate the relationship more directly.

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**References**

Appendix A

Search terms

Alcohol search-terms
ETOH, ALCOHOL, BLOOD ALCOHOL, PBT
Or a diagnosis of Mental & Behavioural disorder due to . . .
ALCOHOL, ALCOHOL USE WITH WITHDRAWAL & DELIRIUM, ALCOHOL USE WITH
WITHDRAWAL STATE
Or a diagnosis of Simple intoxication of . . .
ALCOHOL (excludes poisoning: T519)

Assault search-terms
ALLEGED ASSAULT
Or criminal assault examination. Code also manifestation of assault in
Injury codes: Poisoning . . .
BENZODIAZEPINES, CANNABIS, COCAINE, FOOD, HEROIN, LYSERGIDE (LSD),
METHADONE, OPIUM, OTHER & UNSPECIFIED DRUGS, MEDICAMENTS & BIOLOGICAL
SUBSTANCE, OTHER AND UNSPECIFIED NARCOTICS, OTHER OPIOIDS, OTHER
SYNTHETIC NARTCIS (PETHIDINE), PARACETAMOL, PSYCHODYSLEPTIC,
PSYCHOTROPIC DRUG, AMPHETAMINE / ECSTACY, GHB,
 METHAMPHETAMINE, SEDATIVE, TETRACYCLIC ANTIDEPRESSANT,
TRICYCLIC ANTIDEPRESSANT
Or sexual assault examination. Code also manifestation of assault in Injury codes: Toxic effect of
(excludes poisoning) . . .
ALCOHOL, CHROMIUM AND ITS COMPOUNDS, ORGANIC SOLVENT, PETROLEUM
PRODUCTS, UNSPECIFIED SUBSTANCE

Illicit drugs search-terms
CANNABIS, MARIJUANA, ECSTACY, AMPHETAMINES, SPEED,
 METHAMPHETAMINES, ICE, HEROIN, KETAMINE, GHB
Or a diagnosis of Mental & Behavioural disorder due to . . .
CANNABIS, COCAINE, HALLUCINOGENS, HARMFUL USE OF STIMULANTS
MULTIPLE DRUG USE & USE OF OTHER PSYCHOACTIVE DRUGS, OTHER OR MULTIPLE
DRUGS, SEDATIVES OR HYPNOTICS, TOBACCO, VOLATILE SOLVENTS, OPIOIDS
Or a diagnosis of Simple intoxication of . . .
CANNABINOIDS, COCAINE HALLUCINOGENS, OPIOIDS OTHER OR MULTIPLE DRUGS,
SEDATIVES OR HYPNOTICS, STIMULANTS, VOLATILE SOLVENTS

Excluding cases categorised as ‘Alcohol/Drug-related’ (n = 573).
ETOH, DRINK, ALC, ALCOHOL, ETHO, METHO, DRUNK, DRANK, DETOX, INTOX, PORT, BEER, SLUR, GIN,
SCHOON, BOURB, WINE, SPIRIT, RUM, STUBBIE, VODKA, LONGNECK, CHAMP, CASK, BLOOD ALCOHOL, PBT
Or a diagnosis of Mental & Behavioural disorder due to . . .
ALCOHOL USE WITH WITHDRAWAL & DELIRIUM
ALCOHOL USE WITH WITHDRAWAL STATE
Or a diagnosis of Simple intoxication of . . .
ALCOHOL (excludes poisoning: T519)
ALCOHOL USE WITH WITHDRAWAL & DELIRIUM
ALCOHOL USE WITH WITHDRAWAL STATE

Appendix B

Alcohol-related reasons for ED attendance:
alcohol intoxication; alcohol/drug intoxication; alcohol
assault; alcohol/drug assault; alcohol sexual assault;
alcohol accident; alcohol/drug accident; alcohol traffic
accident; alcohol/drug traffic accident; chronic alcohol;
chronic alcohol/drug; alcohol suicide; alcohol/drug
suicide; alcohol mental health; alcohol/drug mental
health; alcohol domestic violence; alcohol/drug domes-
tic violence; alcohol overdose; alcohol/drug overdose;
Other injury where alcohol or drug use was not stated:
assault; accident; traffic accident; domestic violence;
and sexual assault.
Other sporting events which were of interest in Geelong:
Geelong Football League (GFL) grand final;
Geelong and Districts Football League (GDFL) grand
final;
Bellarine Football League (BFL) grand final;
Geelong Cricket Association (GCA) grand final;
The Australia Day weekend Regatta; and
Geelong Cup.
Non-sporting events which were of interest:
Christmas;

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New Years Eve;  
St. Patrick’s Day;  
Australia Day;  
Geelong Show Day; and  
PakoFesta (a local celebration of diverse cultures within Geelong).

Alcohol hours:

Rumbold et al. [14] identified three categories of alcohol hours:

High alcohol hours: Fridays/Saturdays 8 PM to 6 AM
Medium alcohol hours: Sunday to Thursday 8 PM to 6 AM
Low alcohol hours: All days 6 AM to 8 PM