

Alcohol consumption, masculinity, and alcohol-related violence and anti-social behaviour in sportspeople

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7 **Alcohol consumption, masculinity, and alcohol-related violence and anti-social behaviour in**
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1 **Abstract**

2 *Objective:* There is no research examining alcohol-related aggression and anti-social behaviour in UK
3 or European sportspeople (athletes), and no research has examined relationships between masculinity,
4 alcohol consumption, and alcohol-related aggression and antisocial behaviour in sportspeople
5 (athletes). This study addresses this gap.

6 *Design:* Cross-sectional.

7 *Methods:* A sample ($N=2,048$; women=892, 44%) of in season sportspeople enrolled at UK
8 universities (response 83%), completed measures of masculinity, alcohol consumption, within-sport
9 (on-field) violence, and having been the perpetrator and/or victim of alcohol-related violent/
10 aggressive and antisocial behaviour (e.g., hit/assaulted, vandalism, sexual assault). Logistic
11 regressions examined predictors of alcohol-related violence/aggression and anti-social behaviours.

12 *Results:* Significant bivariate relationships between masculinity, within-sport violence, alcohol
13 consumption, and alcohol-related aggression and anti-social behaviour were found for both men and
14 women ($p's < .001$). Logistic regression adjusting for all variables showed that higher levels of
15 masculinity and alcohol consumption in men and women were related to an increased odds of having
16 conducted an aggressive, violent and/or anti-social act in the past 12 months when intoxicated. Odds
17 ratios were largest for relationships between masculinity, alcohol consumption, within-sport violence,
18 and interpersonal violence/aggression ($p's < .001$). A similar pattern of results was found for having
19 been the victim of aggression and anti-social behaviour.

20 *Conclusions:* Alcohol-related aggression and anti-social behaviour appear to be problematic in UK
21 university sportspeople, and is related to masculinity and excessive drinking. Interventions that reduce
22 excessive alcohol consumption, masculine norms and associated within-sport violence, could be
23 effective in reducing alcohol-related aggression and antisocial behaviour in UK sportspeople.

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26 Key Words: Sport, Alcohol, Masculinity, Violence, Anti-social behaviour

27

1 **Introduction**

2 Excessive alcohol consumption is related to a range of negative health, social and financial
3 consequences for the individual and society more broadly.¹ There is increasing concern about alcohol-
4 related violence and anti-social behaviour. In some countries, alcohol is implicated in over 70% of
5 reported assaults², and alcohol is a known contributor to a range of anti-social behaviours (e.g., drink
6 driving, vandalism), causing significant harms to others.³

7 Excessive alcohol consumption is particularly problematic in sportspeople (athletes), and
8 especially university sportspeople who drink more hazardously than non-sporting peers and the
9 general population.⁴⁻⁶ Most research in the area comes from the United States (US) where alcohol
10 consumption in athletes is associated with a range of harmful behaviours.⁷ For instance, higher rates of
11 violence, vandalism, sexual coercion, and drink-driving are reported by university athletes who drink.⁷
12 However, a recent review of the literature⁸ found that studies on alcohol-related aggression and anti-
13 social behaviour in sport are sparse with only three empirical studies conducted in non-US sporting
14 samples^{8,9}, and no research from the United Kingdom (UK) or Europe.⁸ Similar gaps in the research
15 base are identified for on-field violence,¹⁰ and there is no empirical research examining sociocultural
16 antecedents (e.g., masculinity) of alcohol-related aggression and anti-social behaviour in
17 sportpeople.^{8,10}

18 Masculinity appears to play a role in aggression, anti-social behaviour and excessive alcohol
19 consumption in non-sporting samples.^{11,12} Higher levels of masculinity have been shown to be
20 associated with intimate partner violence, barroom assaults, and sexual coercion.¹² Masculinity is also
21 associated with excessive alcohol consumption, violence and anti-social behaviour in both men and
22 women.¹³ Although different forms of masculinity have been proposed (e.g., hegemonic masculinity,
23 hyper-masculinity) most researchers describe masculinity as a sociocultural construction of the
24 beliefs, traits, and behaviours that are important to being a man and which support the maintenance of
25 dominance and power over others.¹⁴ Masculinity, operationalised here in a manner consistent with
26 hegemonic masculinity,¹⁴ is the degree to which a person identifies themselves as having masculine
27 traits and tendencies (e.g., assertive, dominant, independent, forceful).¹⁵ Masculinity is said to be

1 socialised throughout the lifespan with both men and women varying in the degree to which they
2 internalise masculine traits, beliefs, norms, and practices.^{14,15}

3 Sport theorists suggest that the physically aggressive and confrontational nature of most
4 sports, along with masculine/jock norms, may attract men and women who have more masculine and
5 aggressive tendencies, and/or socialise displays of aggression and/or masculine traits in sport
6 participants.¹⁶⁻¹⁸ Some studies show that men and women do implicitly associate sport with
7 masculinity.¹⁸ Other research suggests that higher levels of masculinity are associated with more
8 violent within-sport behaviour (e.g., illegal hitting, kicking).¹⁹ Weinstein and colleagues¹⁶ found that
9 higher levels of masculinity in ice hockey players were associated with a greater number of penalty
10 minutes for aggressive play and more in game fist fights. Given the masculine nature of sport and
11 high levels of alcohol consumption and associated harms in sportspeople,⁸ it is important to examine
12 the relationship between masculinity and alcohol consumption in explaining the higher rates of
13 alcohol-related aggression and anti-social behaviour observed in sportspeople.^{7,8}

14 Although there is no research on these relationships in sport participants, research in non-
15 sport settings shows a relationship between masculinity, alcohol consumption, and aggression in
16 men.^{11,12,20} Miller and colleagues found that alcohol-related aggression was associated with
17 masculinity in young men and tradesmen, but the association between masculinity and alcohol-related
18 aggression was in part explained by excessive alcohol consumption.^{11,12}

19 There is a paucity of research examining alcohol-related aggression and anti-social behaviour
20 in UK or European sport participants. There is also no research examining the relationship between
21 masculinity, within-sport violence, alcohol consumption, and alcohol related aggression and anti-
22 social behaviour in sportspeople (e.g., physical/sexual assaults, vandalism). The present study sought
23 to address these gaps. We hypothesised that higher masculinity would be related to greater odds of
24 having being involved in alcohol-related aggression and antisocial behaviour, after accounting for
25 other factors (e.g., age, location, within sport violence).

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1 **Methods**

2 A sample of 2,048 in-season sport participants (athletes) over 18 years (mean age=20.14,
3 SD=2.60 years; women=892; 44%) were recruited (response rate 83%) from 10 universities in four
4 regions of England (North East, Midland, London, South England) to participate in the study. Note
5 that while the participants were enrolled with a university they did not necessarily play collegiate
6 sport. Comprehensive details of the sample and sampling approach have been published elsewhere.²¹
7 Briefly, participants from 36 sports completed a questionnaire containing demographic questions
8 (e.g., age, sex, post code/region), the World Health Organisation's Alcohol Use Disorders
9 Identification Test (AUDIT)²², and measures assessing alcohol-related aggression and antisocial
10 behaviour, masculinity, and intentional within-sport violence. Approximately 80% of participants
11 came from the following 10 sports (Football/Soccer 18.5%, Rugby Union/League 18.2%, Hockey
12 8.5%, Cricket 7.2%, Netball 6.7%, Basketball 5%, Athletics 4.7%, Lacrosse 3.9%, Swimming 3.2%,
13 Tennis 2.13%).

14 The AUDIT is a 10-item questionnaire developed to identify persons whose alcohol
15 consumption has become hazardous or harmful (WHO).²² The AUDIT has 3 subscales assessing:
16 alcohol consumption (AUDIT-C), symptoms of alcohol dependence (AUDIT-D), and hazardous
17 consequences of drinking (AUDIT-H). The present study only used the AUDIT-C subscale in
18 analyses, as the AUDIT-D and AUDIT-H encompass aspects of alcohol-related harm overlapping our
19 formal measures of alcohol-related aggression and anti-social behaviour. AUDIT-C scores range from
20 0-12 with a score of ≥ 5 indicating alcohol dependence.²²

21 Participants reported whether they had perpetrated and been the victim of a range of aggressive
22 and/or antisocial behaviours when drinking alcohol in the past 12 months. Common measures of
23 alcohol-related harms and second-hand effects were used,^{23,24} which asked participants whether they
24 had in the past 12 months, 'abused, insulted, or humiliated someone', 'hit, pushed or assaulted
25 someone', 'damaged others property', 'made an unwanted sexual advance', and /or 'drove a motor
26 vehicle' while drinking alcohol. Similarly, participants were asked if they had been the victim of any

1 of the harms described above (excluding 'drove a motor vehicle'). We also asked participants, 'have
2 you been the victim of a sexual assault' due to someone else's intoxication in the past 12 months. Yes
3 responses were coded as 1, no responses as 0.

4 Masculinity was measured using the 10-item masculinity trait scale from Bem's Sex Role
5 Inventory-Brief (BSRI-B) ¹⁵ a well validated measure of masculinity utilised in studies examining
6 alcohol consumption, violence, and masculinity in sports.²⁵ Although there has been theoretical debate
7 regarding the factor structure of BSRI, much of this debate has centred on the femininity subscale,
8 which has shown instability across time. However, the masculinity scale has good face and predictive
9 validity,²⁵ and has been shown to be stable in population scoring across time.²⁶ The masculinity scale
10 asks participants to indicate, using a 7-point scale (1=never/almost never true to 7=always/almost
11 always true), how well specific traits describe them (e.g., aggressive, dominant). Higher scores
12 indicate greater masculinity. Cronbach's alpha for the scale in this study was good ($\alpha=.85$).

13 Because there is no established measure of within-sport violence, we constructed a single
14 item for this purpose. Participants were asked "Have you been intentionally violent (e.g., punching,
15 kicking, elbowing, foul play) toward another sportsperson when playing your sport in the past year?
16 Note that this refers to violent behaviours that are banned in your sport". Yes responses were coded as
17 1, no responses as 0.

18 Data collection was conducted across 14 months encompassing both winter and summer
19 sporting codes. Venues for data collection were identified from university webpage listings and
20 competition schedules posted in newsletters. Non-team sport venues (e.g., tennis), which have smaller
21 numbers of participants, were visited up to five times for data collection. To bypass potential bias in
22 participant recruitment whereby some sports deny access to sportspeople because of sensitivities
23 around alcohol and drug use,²¹ we approached participants directly at playing and training facilities,
24 and sport-related teaching venues. As the study sample is not knowingly representative of the
25 theoretical population of UK athletes we do not make prevalence estimates. Participants were offered
26 a nominal incentive (£2) for participation, and assured that their participation and data would remain

1 confidential. Questionnaires took approximately 15 minutes to complete. Ethics approval was
2 obtained from the universities of Manchester, Loughborough, Brunel and Chichester.

3 Sex differences on variables were tested with simple t-tests for linear variables, and chi-square
4 tests of proportions. Spearman's correlation coefficients were calculated to examine bivariate
5 relationships for variables. We conducted separate logistic regressions for men and women to
6 establish multivariate relationships between aggressive and antisocial behaviours and the independent
7 variables. For the purpose of the logistic regressions, we standardized masculinity and AUDIT-C
8 scores to simplify the interpretation of results and reduce collinearity, but report unstandardized
9 means and standard deviations in table 1. We used multilevel logistic regression in which individual
10 respondents were nested within clusters specific to their gender, sport, and region/location. This
11 analytical structure corrects for the effects of clustering within sports and sampling sites. Because
12 rates of alcohol-related problems have been shown to vary across regions of the UK (e.g., North-
13 West England vs. London), we included location as a fixed effect in multivariate analyses. For the
14 results of the logistic regressions we follow convention and report odds ratios (OR) and associated
15 95% confidence intervals (CI).

16 **Results**

17 Table 1 displays sample characteristics. Most participants had AUDIT-C scores indicative of
18 dependence (AUDIT-C score ≥ 5), and over half reported having insulted/abused someone and being
19 insulted/abused by someone when drinking in the past year. A large proportion of participants also
20 reported having assaulted someone or having been assaulted by someone, or having been involved as
21 a perpetrator or victim of vandalism (damaged property). Men had only slightly, but significantly,
22 higher levels of masculinity than women.

23 Table 2 presents Spearman's correlation coefficients for all variables. There were significant
24 positive associations for men and women between masculinity, AUDIT-C scores, intentional within-
25 sport violence, and most forms of alcohol-related aggression and anti-social behaviours. The largest

1 associations were between masculinity, AUDIT-C, intentional within sport violence, and having
2 insulted/humiliated someone, assaulted someone, or having damaged other people's property.
3 Similarly, stronger correlations were found between AUDIT-C, masculinity, intentional within-sport
4 violence, and having been assaulted by someone else. We conducted post-hoc Fisher's Z tests to
5 establish whether the size of correlations between masculinity, alcohol consumption, and all
6 aggressive and anti-social behaviours differed significantly for sex. The correlations only differed for
7 one outcome variable, with the correlation between alcohol consumption and being the victim of an
8 assault larger for men than women ($Z=3.5, p<.001$, two-tailed).

9 After adjusting for all variables in multivariate logistic models (Table 3), having higher
10 masculinity, AUDIT-C, and having displayed intentional within-sport violence, were positively
11 associated with violence and anti-social behaviour among men and women. For example, higher
12 levels of masculinity in men and women were associated with an increased odds of having
13 insulted/humiliated someone and having assaulted someone when intoxicated. It is noteworthy that in
14 men, higher levels of masculinity were not associated with an increase in the odds of having made an
15 unwanted sexual advance. However, higher levels of masculinity in women were associated with a
16 higher odds of having reported making an unwanted sexual advance. In men, there was a significant
17 positive relationship between masculinity and damaging someone else's property and driving a motor
18 vehicle when drunk, but these relationships were not observed in women. The association between
19 masculinity and having been the victim of aggressive and anti-social behaviours was smaller across
20 all outcomes for men and women.

21 For both men and women, a higher level of alcohol consumption (AUDIT-C scores) was
22 significantly associated with higher odds of having carried out all of the aggressive and anti-social
23 behaviours of interest here. The size of the relationships between alcohol consumption and having
24 insulted/humiliated and having assaulted someone, were nearly identical for women and men. Of
25 note, the relationship between AUDIT-C scores and having made an unwanted sexual advance was
26 larger for women than for men. Similar to the pattern observed for masculinity, for women and men

1 the size of relationships between AUDIT-C and having been the victim of aggressive and anti-social
2 behaviours was smaller than for having carried aggressive and anti-social behaviours when
3 intoxicated. Finally, although all models examining the influence of masculinity and alcohol
4 consumption account for whether participants report having carried out intentional within sport
5 violence, it is clear from table 3 that within sport violence had the largest relationship with having
6 insulted/humiliated someone, and having assaulted someone when intoxicated.

7 **Discussion**

8 No research has examined the relationships between masculinity, alcohol consumption and
9 alcohol-related aggression and anti-social behaviour in sportspeople.¹³ After adjusting for all other
10 variables in multivariate analyses, higher levels of masculinity and alcohol consumption (AUDIT-C)
11 were associated with an increased odds of having committed an aggressive or anti-social act when
12 drinking alcohol for men and women. The effects were largest for relationships between masculinity,
13 alcohol consumption, and interpersonal aggression/violence (i.e., insulting/humiliating someone,
14 physically assaulting someone). A similar pattern of effects was observed for being the victim of
15 alcohol-related aggression and antisocial behaviour. However, masculinity was only associated with
16 making an unwanted sexual advance in women.

17 The findings are consistent with previous work in non-sporting male samples which show that
18 relationships between masculinity and barroom aggression were partly explained by hazardous
19 drinking.^{11,12} However, previous work has focused on men. We found that sportswomen had similar
20 relationships between masculinity, alcohol consumption, and alcohol-related aggression and anti-
21 social behaviours, as sportsmen. Although there was a significant difference in masculinity scores for
22 men and women, this difference was very small ($\approx 5\%$). This finding is new, but supports theoretical
23 predictions suggesting that women in some roles/contexts may have levels of masculinity comparable
24 to men.¹⁵ Sport is a cultural milieu where masculinity and excessive alcohol consumption is
25 commonplace and explicitly and implicitly accepted.^{6,18} For example, although men's and women's

1 levels of alcohol consumption are converging in westernized nations, this convergence appears most
2 obvious in sport.²⁷

3 The high proportions of men and women reporting being involved in alcohol-related aggression
4 (e.g., assaults), either as the aggressor or as the victim, should be of concern to UK sporting bodies.
5 Although different sampling approaches prohibit robust comparisons, it is worth noting that the
6 proportion reporting aggressive and anti-social behaviours here is higher (approximately 17-50%)
7 than in similar studies in Australia.^{8,9,24} Alcohol consumption scores were also considerably higher in
8 the present sample, and may account for the differences in rates of alcohol-related aggression.

9 We also examined the relationship between intentional within-sport violence, masculinity, and
10 alcohol-related violence. Intentional within-sport violence is likely a good surrogate for violent or
11 aggressive tendencies/traits and should, theoretically, be related to masculinity. Intentional within-
12 sport violence was associated with masculinity and aggressive and anti-social behaviours. This
13 supports the notion that masculinity is related to aggressive behaviour, independent of alcohol
14 consumption.²⁸ Caution should be taken in interpreting this result because the proportion of men
15 (28%) and women (6%) reporting intentional within-sport violence was small compared with those
16 reporting alcohol-related aggression. Regardless, masculinity appears to play a role in alcohol-related
17 and non-alcohol related aggression/violence.

18 Understanding the interplay between masculinity, alcohol consumption, and aggression and
19 anti-social behaviour is important to debates on the causes and remedies of alcohol-related violence.²⁶
20 Public health researchers suggest policies that reduce excessive alcohol consumption (e.g., alcohol
21 availability, pricing, alcohol outlet density) as the best approach to addressing alcohol and
22 masculinity-related violence and other harms.²⁹ Others argue that alcohol is used as an excuse for
23 men's violence, and that men's masculinity-related beliefs and behaviours should be the focus of
24 efforts to reduce violence.²⁸ These divergent perspectives are not arbitrary. Government funded
25 national programs for reducing men's violence (e.g., OurWatch)³⁰ seek in part to change masculinity-
26 related beliefs, norms and identity in men as a means for reducing alcohol-related violence. Peak

1 sporting bodies and clubs were identified as key platforms for delivering these programs.³⁰ However,
2 there has been little empirical evidence to support this approach. The results of the present study find
3 that masculinity in men and women is related to a range of alcohol-related aggressive behaviours. As
4 such the present results provide evidence for policy debates, and in part, support calls for the inclusion
5 of approaches to address masculinity-related traits, beliefs, norms, in alcohol and violence reduction
6 programs, particularly in sport settings.^{29,30}

7 There are some limitations to the study. The sampling approach prevents calculation of
8 prevalence estimates for aggressive and anti-social behaviour, and prevents direct comparisons
9 between different sporting codes and sex. Similarly, we are unable to establish whether levels of
10 masculinity vary between different sporting codes that may attract those with higher levels of
11 masculinity. The correlational design also prevents any inferences of causation. Large scale
12 longitudinal studies in representative samples of athletes are needed to address these limitations.
13 Known difficulties in gaining research approval from sporting codes who may be risk averse on issues
14 such as alcohol (e.g., negative publicity, relationships with alcohol industries), will need to be
15 overcome in order to ensure representativeness of samples.

16 **Conclusion**

17 Notwithstanding these limitations, the study provides needed evidence on the relationship
18 between masculinity, alcohol consumption, and alcohol-related violence and anti-social behaviour in
19 sportspeople. Higher levels of masculinity and alcohol consumption in men and women were
20 associated with an increased probability of alcohol-related aggression and anti-social behaviour. The
21 findings suggest that policies and/or interventions that address excessive alcohol consumption and
22 masculinity-related beliefs and norms could reduce alcohol-related aggression in sportspeople.

23 **Practical implications**

- 24 • Higher levels of masculinity in both men and women were associated with increased odds of
25 drinking excessively and being involved in alcohol-related aggression and anti-social
26 behaviour.

- 1 • Overall levels of aggressive and antisocial behaviour and alcohol consumption were high in
2 this sample of UK sportspeople.
- 3 • Reducing alcohol-related violence in the community is a focus for several governments.
4 Sporting bodies and organisations could play an important role in reducing alcohol-related
5 violence and anti-social behaviour in the wider community.

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9 Research Council in collaboration with VicHealth, Victoria, Australia, Alcohol and Drug Foundation,
10 Australia, and Australian National Preventative Health Agency, Australia.

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1 **Table 1** Characteristics of the participants. Numbers other than means and 95% confidence intervals
 2 represent raw counts and percentages (%) of the location and of sportspeople having caused and/or
 3 been victim of alcohol-related aggressive and/or antisocial behaviour when drinking alcohol in past
 4 year.

Variables	Women n = 723 (42)	Men n = 997 (58)	Total n = 1720
Mean age	19.76 (19.64, 19.87)	19.98* (19.86, 20.09)	19.88 (19.80, 19.97)
Mean AUDIT-C	7.81 (7.63, 8.00)	8.28* (8.11, 8.44)	8.08 (7.96, 8.21)
Mean masculinity	4.71 (4.65, 4.78)	4.96** (4.91, 5.02)	4.86 (4.82, 4.90)
Within sport violence	42 (6)	275 (28)**	317 (18)
Location			
London	92 (13)	113 (11)	205 (12)
Midlands	109 (15)	145 (15)	254 (15)
Northwest	323 (45)	417 (42)	740 (43)
Southern	199 (27)	322 (32)	521 (30)
Did aggressive and/or antisocial behaviour			
Insulted/humiliated others	368 (51)	744 (75)**	1112 (65)
Assaulted others	172 (24)	412 (41)**	584 (34)
Damaged others' property	129 (18)	430 (43)**	559 (33)
Made unwanted sexual advance	70 (10)	169 (17)**	239 (14)
Drove a motor vehicle	50 (7)	184 (18)**	234 (14)
Received aggressive and/or antisocial behaviour			
Was insulted/humiliated	392 (54)	662 (66)**	1054 (61)
Was assaulted	289 (40)	561 (56)**	850 (49)
Own property damaged	194 (27)	359 (36)**	553 (32)
Received unwanted sexual advance	283 (39)	297 (30)**	580 (34)
Was sexually assaulted	29 (4)	41 (4)	70 (4)

5 Significance level, $p < .01^*$, $p < .001^{**}$

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1 **Table 2** Spearman's correlation coefficients for all variables in the study. Men's results are displayed below the diagonal, and women's above.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	--	-.02	-.09**	.03	-.07*	-.07	.01	.02	.01	-.03	-.04	.01	.04	.09**
2. Within sport violence	-.05	--	.14***	.12**	.17***	.18***	.15***	.05	.16***	.12**	.16***	.06	.14***	.16***
3. AUDIT-C	-.06*	.19***	--	.16***	.35***	.28***	.25***	.14***	.18***	.18***	.16***	.13**	.16***	.01
4. Masculinity	.10**	.18***	.12***	--	.21***	.18***	.09*	.05	.15***	.15***	.15***	.08*	.15***	.09*
5. Insulted/humiliated others	.04	.25***	.37***	.20***	--	.36***	.30***	.18***	.17***	.46***	.29***	.24***	.23***	.09*
6. Assaulted others	-.01	.31***	.35***	.20***	.39***	--	.22***	.26***	.20***	.23***	.43***	.22***	.14***	.09**
7. Damaged property	.003	.29***	.32***	.14***	.42***	.49***	--	.17***	.21***	.19***	.16***	.27***	.14***	.10**
8. Drunk driving	.03	.13***	.13***	.11***	.17***	.26***	.28***	--	.10**	.11**	.12***	.10**	.05	.11**
9. Made unwanted sexual advance	.05	.09**	.17***	.08*	.23***	.21***	.24***	.15***	--	.14***	.13***	.14***	.31***	.19***
10. Insulted by someone	.05	.14***	.26***	.13***	.49***	.32***	.30***	.06*	.19***	--	.38***	.29***	.15***	.10**
11. Assaulted by someone	.03	.24***	.31***	.18***	.43***	.58***	.42***	.17***	.17***	.48***	--	.24***	.22***	.16***
12. Property damaged	.08**	.16***	.19***	.11***	.27***	.29***	.39***	.15***	.23***	.34***	.39***	--	.25***	.14***
13. Received unwanted sexual advance	.07*	.12***	.17***	.09**	.20***	.18***	.23***	.12***	.42***	.18***	.21***	.29***	--	.18***
14. Was sexually assaulted	.05	.09**	.05	.03	.13***	.11***	.01	.12***	.24***	.10***	.10**	.18***	.27***	--

2 Significance level $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

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1 **Table 3** Bivariate and multivariate (adj) odds ratio's (OR) and 95% confidence intervals for relationships between independent variables and having done, and/or
 2 been the victim of, alcohol-related aggression and antisocial behaviours.

Predictors	Insulted/humiliated others (men)		Assaulted others (men)		Damaged property (men)		Made unwanted sexual advance (men)		Drove a motor vehicle drunk (men)	
	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)
Age	1.07 (0.99,1.17)	1.09 (0.99,1.19)	0.98 (0.92,1.06)	1.00 (0.93,1.08)	1.01 (0.94,1.08)	1.04 (0.96,1.12)	1.02 (0.93,1.12)	1.02 (0.93,1.13)	1.03 (0.95,1.13)	1.06 (0.97,1.15)
Location (ref: London)										
Midlands	0.72 (0.39,1.34)	1.34 (0.74,2.42)	0.59 (0.33,1.08)	0.81 (0.45,1.46)	0.78 (0.45,1.34)	1.35 (0.76,2.40)	0.76 (0.34,1.71)	1.50 (0.60,3.73)	0.50* (0.28,0.90)	0.51 (0.25,1.07)
Northwest	1.43 (0.86,2.40)	1.48 (0.89,2.46)	1.53 (0.99,2.38)	1.30 (0.79,2.14)	1.51* (1.03,2.22)	1.71* (1.04,2.81)	2.11** (1.21,3.67)	2.05 (0.93,4.53)	0.92 (0.61,1.39)	0.78 (0.44,1.38)
Southern	1.36 (0.77,2.38)	1.44 (0.85,2.43)	1.37 (0.79,2.38)	0.92 (0.55,1.54)	1.21 (0.74,1.97)	1.18 (0.71,1.97)	0.70 (0.36,1.37)	0.89 (0.37,2.15)	1.68* (1.12,2.52)	1.18 (0.67,2.11)
Within sport violence	5.34*** (3.32,8.58)	4.06*** (2.45,6.72)	4.02*** (2.96,5.45)	3.20*** (2.32,4.40)	3.87*** (2.86,5.25)	3.18*** (2.32,4.37)	1.66** (1.14,2.40)	1.43 (0.98,2.09)	1.92*** (1.36,2.71)	1.55* (1.08,2.21)
AUDIT-C	2.52*** (2.15,2.94)	2.35*** (2.00,2.77)	2.48*** (2.04,3.00)	2.21*** (1.82,2.68)	2.20*** (1.85,2.63)	1.98*** (1.66,2.37)	1.82*** (1.42,2.33)	1.76*** (1.37,2.26)	1.52*** (1.24,1.86)	1.44*** (1.17,1.77)
Masculinity	1.54*** (1.32,1.80)	1.50*** (1.27,1.78)	1.49*** (1.30,1.72)	1.35*** (1.16,1.57)	1.31*** (1.14,1.50)	1.16* (1.01,1.34)	1.17 (0.98,1.41)	1.11 (0.92,1.33)	1.36*** (1.14,1.62)	1.26* (1.06,1.51)

1 Table 3 Cont'd

Predictors	Was insulted/humiliated (men)		Was assaulted (men)		Own property damaged (men)		Received unwanted sexual advances (men)		Was sexually assaulted (men)	
	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)
Age	1.04 (0.97,1.12)	1.05 (0.97,1.13)	0.98 (0.91,1.04)	0.98 (0.91,1.05)	1.06 (0.98,1.13)	1.05 (0.98,1.13)	1.05 (0.98,1.13)	1.05 (0.97,1.13)	1.10 (0.94,1.29)	1.09 (0.93,1.27)
Location (reference: London)										
Midlands	0.90 (0.57,1.43)	1.24 (0.73,2.12)	0.90 (0.57,1.42)	1.19 (0.70,2.05)	1.28 (0.74,2.21)	2.70** (1.47,4.96)	1.02 (0.62,1.69)	1.37 (0.76,2.46)	1.40 (0.47,4.17)	5.37 (0.66,44.01)
Northwest	1.60** (1.17,2.21)	1.40 (0.88,2.21)	1.48* (1.08,2.02)	1.28 (0.81,2.04)	1.86** (1.27,2.72)	3.36*** (1.95,5.78)	1.75** (1.25,2.46)	1.70* (1.03,2.83)	2.60* (1.12,6.01)	5.90 (0.78,44.48)
Southern	0.85 (0.58,1.25)	0.91 (0.57,1.46)	0.92 (0.63,1.34)	0.87 (0.54,1.40)	0.80 (0.50,1.28)	1.58 (0.90,2.77)	0.70 (0.46,1.05)	0.88 (0.52,1.51)	0.34 (0.11,1.04)	1.39 (0.16,12.19)
Within sport violence	1.96*** (1.42,2.71)	1.50* (1.07,2.10)	3.02*** (2.20,4.13)	2.29*** (1.64,3.19)	2.09*** (1.54,2.82)	1.74*** (1.28,2.35)	1.70*** (1.26,2.31)	1.49* (1.09,2.04)	2.16* (1.12,4.16)	2.03* (1.05,3.93)
AUDIT-C	1.81*** (1.57,2.07)	1.72*** (1.50,1.99)	2.16*** (1.85,2.53)	1.98*** (1.69,2.32)	1.44*** (1.23,1.69)	1.36*** (1.17,1.59)	1.49*** (1.26,1.76)	1.43*** (1.21,1.69)	1.40 (0.93,2.09)	1.29 (0.86,1.94)
Masculinity	1.27*** (1.11,1.45)	1.20* (1.04,1.38)	1.41*** (1.23,1.61)	1.31*** (1.14,1.52)	1.24** (1.08,1.43)	1.17* (1.01,1.34)	1.18* (1.02,1.36)	1.12 (0.96,1.29)	1.08 (0.78,1.50)	0.97 (0.71,1.34)

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1 Table 3 Cont'd

Predictors	Insulted/humiliated others (women)		Assaulted others (women)		Damaged property (women)		Made unwanted sexual advance (women)		Drove a motor vehicle drunk (women)	
	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)
Age	0.92 (0.84,1.01)	0.97 (0.87,1.08)	0.90 (0.80,1.02)	0.94 (0.83,1.08)	0.94 (0.83,1.08)	1.00 (0.87,1.16)	0.99 (0.85,1.17)	1.04 (0.87,1.23)	1.09 (0.93,1.28)	1.16 (0.97,1.37)
Location (ref: London)										
Midlands	0.85 (0.52,1.39)	1.13 (0.59,2.17)	0.70 (0.40,1.23)	1.03 (0.47,2.27)	0.48 (0.22,1.04)	0.60 (0.24,1.51)	1.44 (0.63,3.30)	2.07 (0.71,6.04)	0.47 (0.17,1.33)	0.45 (0.13,1.56)
Northwest	1.06 (0.70,1.60)	0.71 (0.41,1.23)	1.30 (0.87,1.96)	0.98 (0.51,1.88)	1.49 (0.87,2.54)	0.89 (0.43,1.85)	1.65 (0.83,3.28)	1.16 (0.45,2.98)	1.26 (0.71,2.24)	0.66 (0.28,1.56)
Southern	1.10 (0.72,1.69)	0.77 (0.43,1.39)	1.07 (0.66,1.73)	0.88 (0.44,1.77)	1.03 (0.56,1.88)	0.71 (0.32,1.55)	0.41* (0.18,0.94)	0.46 (0.15,1.39)	0.92 (0.48,1.77)	0.66 (0.25,1.69)
Within sport violence	5.83*** (2.39,14.20)	4.03** (1.58,10.29)	4.37*** (2.28,8.38)	2.94** (1.48,5.83)	3.09** (1.56,6.14)	2.36* (1.17,4.76)	3.83*** (1.78,8.24)	2.63* (1.17,5.91)	1.91 (0.72,5.10)	1.44 (0.53,3.94)
AUDIT-C	2.68*** (2.17,3.30)	2.61*** (2.10,3.25)	2.53*** (1.93,3.31)	2.28*** (1.72,3.00)	2.64*** (1.92,3.62)	2.51*** (1.81,3.47)	2.49*** (1.65,3.76)	2.38*** (1.56,3.62)	2.06*** (1.34,3.16)	2.11** (1.34,3.31)
Masculinity	1.50*** (1.28,1.76)	1.40*** (1.18,1.66)	1.53*** (1.27,1.84)	1.37** (1.13,1.67)	1.19 (0.98,1.46)	1.04 (0.84,1.28)	1.69*** (1.28,2.22)	1.53** (1.16,2.03)	1.21 (0.90,1.62)	1.06 (0.78,1.43)

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1 Table 3 Cont'd

Predictors	Was insulted/humiliated (women)		Was assaulted (women)		Own property damaged (women)		Received unwanted sexual advances (women)		Was sexually assaulted (women)	
	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)	OR (95% CI)	Adj. OR (95% CI)
Age	0.97 (0.88,1.06)	0.98 (0.89,1.08)	0.94 (0.85,1.04)	0.95 (0.86,1.05)	1.01 (0.91,1.12)	1.02 (0.92,1.14)	1.01 (0.92,1.12)	1.02 (0.92,1.14)	1.19 (0.97,1.45)	1.20 (0.97,1.48)
Location (reference: London)										
Midlands	0.80 (0.53,1.21)	0.78 (0.44,1.39)	0.83 (0.52,1.32)	0.85 (0.45,1.61)	0.71 (0.40,1.24)	0.75 (0.37,1.52)	0.93 (0.52,1.67)	1.13 (0.54,2.38)	1.06 (0.28,4.00)	2.22 (0.33,14.78)
Northwest	1.07 (0.79,1.43)	0.74 (0.46,1.21)	1.10 (0.76,1.58)	0.82 (0.47,1.42)	1.29 (0.84,1.97)	0.97 (0.53,1.75)	1.72* (1.07,2.74)	1.26 (0.64,2.46)	2.23 (0.80,6.18)	2.72 (0.51,14.58)
Southern	0.98 (0.70,1.35)	0.73 (0.44,1.24)	0.96 (0.65,1.42)	0.75 (0.42,1.34)	0.91 (0.57,1.47)	0.79 (0.42,1.47)	0.59* (0.35,0.97)	0.62 (0.31,1.25)	0.50 (0.14,1.77)	1.17 (0.17,7.86)
Within sport violence	3.29** (1.55,6.98)	2.54* (1.18,5.47)	4.12*** (2.05,8.27)	3.25** (1.60,6.62)	1.65 (0.84,3.21)	1.39 (0.71,2.74)	3.36*** (1.66,6.78)	2.70** (1.32,5.53)	5.72*** (2.12,15.44)	5.25** (1.87,14.72)
AUDIT-C	1.43*** (1.22,1.67)	1.37*** (1.16,1.62)	1.42*** (1.19,1.69)	1.32** (1.10,1.58)	1.36** (1.12,1.65)	1.32** (1.07,1.62)	1.51*** (1.25,1.83)	1.45*** (1.19,1.76)	1.18 (0.76,1.84)	1.07 (0.67,1.72)
Masculinity	1.33*** (1.14,1.54)	1.25** (1.07,1.46)	1.39*** (1.18,1.62)	1.31** (1.11,1.55)	1.19* (1.00,1.41)	1.13 (0.95,1.34)	1.39*** (1.17,1.64)	1.31** (1.10,1.55)	1.60* (1.07,2.41)	1.40 (0.92,2.12)

2 * Significant at the $p < .05$ level. ** Significant at the $p < .01$ level. *** Significant at the $p < .001$ level. AUDIT-C = Alcohol Use Disorders Identification Test,
3 consumption subscale. OR = bivariate odds ratios. Adj. OR = multivariate odds ratio's adjusting for all other predictors in the model. CI = 95% confidence interval.
4 Note for multivariate analysis data on all variables was provided by N=1720.

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