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Title	A study to assess smoking habits and smoking exposure in sportspeople
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Publication date	2020-06-28
Original Citation	O'Sullivan, B., Scully, P., Curtin, R. J. and Plant, B. J. (2020) 'A study to assess smoking habits and smoking exposure in sportspeople', QJM: An International Journal of Medicine, 114(5), pp. 306-310. doi: 10.1093/qjmed/hcaa189
Type of publication	Article (peer-reviewed)
Link to publisher's version	10.1093/qjmed/hcaa189
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Download date	2026-11-05 10:38:23
Item downloaded from	https://hdl.handle.net/10468/12073



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A study to assess smoking habits and smoking exposure in sportspeople

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Abstract

Background: Tobacco smoking is a leading public health concern and is the most preventable cause of morbidity and mortality worldwide. Sportspeople are no exception and those who smoke are predisposed to the same hazardous health effects as the general public, in addition to the potential effects it may have on their sporting performance.

Aims: We aimed to ascertain the prevalence of tobacco consumption in a sporting population. We also endeavoured to quantify the use of E-cigarettes and assess exposure to passive smoking.

Design: Observational study.

Methods: A web-based e-questionnaire was distributed to participants from various sports across Ireland between November 2017 and January 2018, and data was analysed using SPSS.

Results: 546 sportspeople completed the survey with more than twice as many male respondents. 16% of participants were current smokers, with males significantly more likely to smoke ($p < 0.001$). 26% of Rugby players were current smokers which was significantly higher compared to other sports ($p < 0.01$). 10% of all participants were exposed to second-hand smoke for more than 1 hour per day. 2% of all participants were current users of E-cigarettes

Conclusions: The prevalence of smoking in our study population was higher than other literature reports. Further studies are essential to evaluate the potential negative effects this may be having on sporting performance, career progression and indeed injury occurrence/rehabilitation. It is imperative to address the matter of smoking in athletes, not only for public health concerns but also considering they are important role models in our society.

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Background

Tobacco smoking is one of the leading public health concerns worldwide. It is the most preventable cause of morbidity and mortality globally. According to the WHO, Tobacco smoking is linked with approximately 7 million deaths each year [1]. In Ireland more than 5,000 people die each year from diseases caused by tobacco use, which represents approximately 19% of all deaths [2]. Sportspeople are no exception and those who smoke are predisposed to the same hazardous health effects as the general public, in addition to the potential effects it may have on their performance.

Smoking can have a harmful effect on the musculoskeletal system. Studies have shown that smoking can significantly impair bone health and increase the risk of fractures which could be a potential detrimental injury to a sportsperson [3]. Smoking also has a negative influence on other key components of the musculoskeletal system such as muscles and tendons, where smoking can cause a significant reduction in muscle strength which could potentially increase the risk of injury to the athlete [4]. Inhalation of cigarette smoke can also have a deleterious effect on the aerobic capacity of an athlete by causing a reduction of VO2 max [5].

There is currently a paucity of evidence on smoking prevalence and behaviours on sportspeople in Ireland. In light of the minimal literature in this area, we felt it was important to examine the smoking behaviours in an Irish sporting population. The main aims of this study were to provide an overview of smoking prevalence in a sporting population, assess exposure to passive smoking and quantify the use of E-cigarettes.

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Methods

Study Design

This observational study was retrospective in design and included participants that competed in various sports across Ireland. A web-based e-questionnaire was distributed in order to collect data. The study took place between November 2017 and January 2018.

Ethical approval

Ethical approval was sought and sanctioned prior to initiating data collection through the Clinical Research Ethics Committee (CREC) of the Cork University Teaching Hospitals, Ireland.

Questionnaire

A modified version of the ''Healthy Ireland Survey'' was used to obtain a standardised assessment of participants' smoking behaviours. Demographic data was collected including, age, sex and type of sport played. A sportsperson was defined as a person who participated or competed in a sport at the time of answering the questionnaire. Information of participants' current smoking status (Smoker/ Non-smoker), data on the use of e-cigarettes and data on the exposure to passive smoking in all participants was recorded. A smoker was defined as a person who smoked tobacco products at the time of answering the questionnaire; this was either a current daily smoker or a current occasional smoker, regardless of the quantity of tobacco products consumed. An e-cigarette user was defined as a person who used E-cigarettes at the time of answering the questionnaire. Second-hand smoker exposure was defined as inhalation of smoke by persons other than the intended user. A pilot study was carried out on an initial set of 20 sportspeople to evaluate the survey and the data obtained. This allowed for the referral data to be analysed and any potential sources of ambiguous information to be discussed. This initial pilot data recorded was not included in the final analysis.

Participants

The cohorts used in this study were those involved with various sports across Ireland. These sports included Rugby, Soccer, Gaelic games (Hurling / Camogie / Gaelic football) and Athletics. An option was also given for 'Other' sport and mostly included sportspeople from

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rowing and hockey. The majority of the participants competed in sports at an amateur and recreational level. Inclusion criteria for this study incorporated participants who actively took part within a sport. Exclusion criteria included participants under the age of 18 and also those who were not willing to take part in the study.

Sampling method

A web-based e-questionnaire was distributed to sports teams and sportspeople via ''WhatsApp'' and ''Facebook''. Participants' enrolment was voluntary, having being informed of the objectives and nature of the study. The survey required an average of 4 minutes to complete. All data remained anonymised and data was stored electronically, password protected and handled in full compliance with Irish Data Protection Law and Principles. There was no anticipated risk to participants of the study.

Statistical Analysis

Data was transferred from a web-based survey platform to the Microsoft Excel programme where it was further formatted. SPSS version 20 was used for further analysis of coded data. An overall summary of the smoking data was analysed and subsequently comparisons made based on, Gender (Female / Male), Sport played (Rugby/ Hurling/ Camogie/ Gaelic Football/ Soccer/ Athletics/ Other), Age group (18-24 / 25-29/ 30-34 / >35) and Current Smoking status (Smoker/ Non-smoker). Comparison data was analysed using chi-square testing. Differences were considered significant at $p<0.05$.

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Results

Study participants

Questionnaires were distributed to 1500 sportspeople. During the sampling period a total of 554 sportspeople completed the survey. 8 responses were excluded as they did not meet the inclusion criteria. 70% of respondents were male (Table 1), and the mean age of the cohort was 25.9 years. 24% (n=129) of participants played Rugby, 24% (n=132) Hurling/Camogie, 20% (n=108) Gaelic Football, 16% (n=86) Soccer, 5% (n=31) Athletics and 11% (n=60) ''Other'' Sports.

Current smokers

16% (n=87) of participants were current smokers. 41% of current smokers, smoked daily and 59% smoked occasionally. Males were significantly more likely to smoke compared to females (20% v 6%; p <0.001). Rugby players (26%) had significantly higher current smoking rates when compared to other sports (p <0.01) (Table 2).

Second-hand smoke exposure

10% of all participants were exposed to second-hand smoke for more than 1 hour per day. Current smokers were significantly more likely to be exposed to second-hand smoke compared to non-smokers (22% V 8%, p <0.001) (Table 3). Participants from Athletics and ''Other'' sports were significantly less likely to be exposed to second-hand smoke when compared to other sports groups (p <0.01). The older age group (>35 years) were significantly less likely to be exposed to second-hand smoke when compared to the other age groups (p <0.001).

E-cigarette consumption

2% of all participants were current users of E-cigarettes. Current smokers were significantly more likely to currently use E-cigarettes when compared to non-smokers (8% v 1%, p <0.001). The age group 18-24 were significantly more likely to try E-cigarettes when compared to older age group >35 (23% v 6%, p <0.01). Males were significantly more likely to try E-cigarettes compared to females (21% v 8%, p <0.01).

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Table 1: Participant Demographics

	Overall (n=546)	***Female (n=162)***	***Male (n=384)***	χ^2
Age Group				
18-24	49% (n=269)	55% (n=90)	47% (n=179)	4.36 (p=0.22)
25-29	24% (n=130)	22% (n=35)	25% (n=95)	
30-34	17% (n=95)	16% (n=26)	18% (n=69)	
35+	10% (n=52)	7% (n=11)	10% (n=41)	
Main Sport				
Rugby	24% (n=129)	22% (n=36)	24% (n=93)	201.1 (p<0.001)***
Hurling / Camogie	24% (n=132)	19% (n=31)	26% (n=101)	
Gaelic Football	20% (n=108)	24% (n=38)	19% (n=70)	
Soccer	16% (n=86)	3% (n=5)	21% (n=81)	
Athletics	5% (n=31)	4% (n=7)	6% (n=24)	
Other	11% (n=60)	28% (n=45)	4% (n=15)	

Values given are frequencies (%, total frequency). Level of significance is represented as: *p < 0.05, ** p < 0.01, *** p < 0.001.

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Table 2: Subgroups: Current smoker

	Overall (n=546)	**χ^2**
Gender		
Male	20% (n=77)	16.4 (p<0.001)***
Female	6% (n=10)	
Age Group		
18-24	16% (n=42)	
25-29	17% (n=22)	13.0 (p=0.99)
30-34	16% (n=15)	
35+	15% (n=8)	
Main Sport		
Rugby	26% (n=34)	
Hurling / Camogie	17% (n=22)	
Gaelic Football	12% (n=13)	20.25 (p<0.01)**
Soccer	15% (n=13)	
Athletics	0% (n=0)	
Other	8% (n=5)	

Values given are frequencies (%, total frequency). Level of significance is represented as: *p < 0.05, ** p < 0.01, *** p < 0.001.

Table 3: Smoker Vs Non-smoker: Second-hand smoke exposure

	Overall (n=546)	***Smoker (n=87)***	***Non-Smoker (n=459)***	**χ^2**
Smoke Exposure				
Never/almost never	51% (n=277)	28% (n=24)	55% (n=253)	28.57(p<0.001)***
<1 Hour daily	39% (n=214)	50% (n=44)	37% (n=170)	
>1 Hour daily	10% (n=55)	22% (n=19)	8% (n=36)	

Values given are frequencies (%, total frequency). Level of significance is represented as: *p < 0.05, ** p < 0.01, *** p < 0.001.

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Discussion

The prevalence of smoking in our study population was higher than other previous reports but less than reported in the general population. Smoking rates were higher in males and in certain sports such as rugby. A significant number of participants were exposed to second-hand smoke and E-cigarette consumption was highest amongst current smokers and the younger age groups.

There were more than twice as many male participants compared to female participants in this study. Female representation in our cohort was more when compared to other similar type studies [6, 7] (0% and 24% respectively). The mean age of the study cohort was 25.9 years and this was comparable to similar studies [6, 8]. This study mainly comprised of team-sports such as Soccer, Rugby and Gaelic games. These are amongst some of the most popular played sports in Ireland and are also predominantly played by more male than female athletes [9], so therefore, this study is likely to be a good representation of the Irish sporting population, especially from a team-sport perspective.

According to our study results, 16% of sportspeople who participate in sport were current smokers. The prevalence of smoking in our study population was higher than other literature reports. A study looking at smoking prevalence amongst a group of Finnish athletes noted smoking rates of 11% [8]. Another similar study amongst a group of Iranian athletes noted that 9% of the cohorts were smokers [6]. There are some potential explanations for the higher smoking rates seen in our study. The participants from this study mainly consisted of amateur sportspeople compared to the professional and elite athletes of the other studies [6, 8]. One would expect that higher level athletes would be more health conscious and aware of using substances that may potentially hinder their performance.

The current smoking rate of sportspeople seen in this study was less than that reported in Irish general population. In 2017, results from the ''Healthy Ireland survey'' reported that 22% of Irish population were current smokers [10]. Some studies indicate that participation in physical activity is protective against smoking. In an American study, higher rates of physical activity were associated with a reduced risk of smoking during adolescence [11]. In another

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study amongst a group of Italian students, those who engaged in sporting activities, smoked less than their inactive peers [12].

Males were significantly more likely to smoke compared to females. A study amongst a group of U.S. Special Olympic athletes found comparable results [13]. The findings from this study are also consistent with Irish reports indicating that women in the general population have a lower smoking rate [10]. These results are an interesting finding especially in terms of smoking cessation, and researchers are now calling for increased awareness and attention to targeted smoking prevention and cessation programs, together with the use of gender-sensitive interventions [14].

26% of Rugby players were current smokers which was significantly higher compared to other sports such as Athletics ($p < 0.01$). In both an American and Swedish study, team and contact sports were also shown to carry higher smoking rates [15, 16]. Another study highlighted that participants from team sports were more likely to socialize and consume alcohol than sportspeople from individual sports [17]. This is possibly due to peer pressure and/or the fact that being a team player might change some social habits. Targeted smoking cessation strategies for team and contact sports may be of increased benefit.

Our study indicated that 10% of all participants were exposed to second-hand smoke for more than one hour per day. Sportspeople are vulnerable to the many ill effects of second-hand smoke. One study described that passive smoking can cause a significant reduction in numerous spirometry measures in athletes, such as forced expiratory volume in the first second (FEV1) [18]. Exposure to second-hand smoke can also cause a reduction of lung function and increase the incidence of respiratory symptoms in athletes [18, 19].

The overall current use of Electronic cigarettes (E-cigarettes) across all participants was 2%. Given the only recent development and widespread use E-cigarettes, very little is known in relation to its potential adverse effects, especially in relation to its cardiovascular risk profile. Nicotine, through increasing catecholamine levels, can potentially increase the risk of myocardial ischaemia and arrhythmia associated with acute exercise [20], and most guidelines would at least recommend avoiding nicotine containing products 2 hours prior to and after an exercise session [20]. Some of the inhaled components of E-cigarettes such as

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propylene-glycol could impair ventilation through significantly increasing airway resistance [21], thus potentially impairing an athlete's performance.

The younger age groups (18-24) were significantly more likely to try E-cigarettes when compared to the other age groups ($p<0.01$). These results are supported by the literature and it appears that experimentation with E-cigarettes is rapidly growing across the younger population and is almost twice as common as experimentation with tobacco [22]. Its use is not only increasing in smokers but also in the non-smoker category also [22]. The use amongst this age-group is fast becoming a major health concern and this fear is further heightened with the uncertain safety profile associated with E-Cigarettes [23, 24].

This study had some limitations. Firstly there was a relatively low response rate. This leads to potential responder bias. Additionally as data was collected by a self-reported survey, sportspeople may suppress their true behaviour, leading to potential inaccuracies of results such as current smoking status.

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Conclusions

This study successfully describes, for the first time, smoking behaviours in an Irish sporting population. The prevalence of smoking in our study population was higher than other previous reports. This study highlighted that certain groups such as those from team sports and male gender had the greatest risk for smoking.

Rates of smoking among sportspeople in Ireland were also lower that seen in the general population. It seems therefore that participating in sports has a preventative effect on unhealthy habits. Despite this, for now it is imperative to address the matter of smoking in sportspeople, not only for public health concerns but also considering they are important role models in our society.

Across Ireland, there are thousands of people involved with sports clubs and societies and there is ample opportunity to raise awareness about the hazardous effects of smoking. We need to encourage educational campaigns on smoking cessation at both local and national levels targeting all age groups and sports. Considering that many sports have become increasingly professional in their holistic approach to training, this study might highlight a crucial, simple intervention that not only will improve public health concerns but also enhance sporting performances at individual and team levels.

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