Tobacco and alcohol use among healthcare workers in three public hospitals in KwaZulu-Natal, South Africa

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Abstract

Background: Tobacco use is a risk factor for most of the leading causes of death in the world. Healthcare workers (HCWs) can play an important role in assisting patients to stop smoking, but this role is undermined if they themselves smoke. The study determined the prevalence of tobacco smoking and alcohol use among HCWs in public hospitals in KwaZulu-Natal, South Africa.

Methods: In a cross-sectional study, 650 self-administered anonymous questionnaires (primary and secondary questionnaires) were administered to participants between December 2009 and June 2010. Six hundred and twenty primary questionnaires (on smoking) and 630 secondary questionnaires (on alcohol use) were returned, giving a response rate of 95% and 97% respectively. The Pearson chi-square test was used to test for statistical significance.

Results: Eleven per cent of the participants were current smokers and 7.1% former smokers, while 27% of never-smokers were constantly exposed to second-hand smoke. Males were 13 times more likely to smoke than their female counterparts ($P < 0.001$). Never-smokers more frequently counselled their smoking patients to quit compared to former and current smokers (47.5%, 39.5% and 25.8% respectively). Alcohol use problems were reported by 22% of participants ($P < 0.001$). Current smokers were six times more likely to drink excessively than never-smokers ($P < 0.001$) and males were ten times more likely than females to drink excessively ($P < 0.001$).

Conclusion: The smoking rate among HCWs is still high, although lower than the national average of 21.4%. A large number of participants reported exposure to second-hand smoke and alcohol use problems. Less than half of the HCWs counselled smoking patients to quit smoking.

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Introduction

Tobacco use has been described as the single greatest preventable cause of death in the world, and up to half of all cigarette smokers may be killed by their addiction.[1] Medical evidence of the harmful effects of tobacco use has been available for about 200 years. However, this evidence was generally ignored until five case-control studies were published in 1950 demonstrating positive associations between cigarette smoking and lung cancer.[2] In 1954, Richard Doll and co-workers published a landmark study that showed a strong association between tobacco smoking and the risk of lung cancer.[3] Since then, tobacco use has been shown to be associated with many different cancers and a major risk factor for six of the eight leading causes of death worldwide.[1] More than one billion people worldwide currently smoke tobacco and it is estimated that more than five million people worldwide die each year as a result of tobacco use.[1] Based on the current trends, the World Health Organization has predicted that by 2030 more than eight million people will die of tobacco-related illnesses each year.[1]

In South Africa, the smoking prevalence among adults has declined from 34% (52% male and 17% female) in 1995[4] to 21.4% (35.8% male and 8.1% female) in 2003.[5] The smoking prevalence among health care workers (HCWs) varies widely around the world. A study carried out in 1991 among hospital staff at Llandough Hospital, Cardiff, showed that 20% of nurses and 5% of doctors smoked.[6] A review by Smith and Leggat carried out in 2004 showed a high smoking prevalence among physicians in Greece (49%), China (45%), Japan (43%), Kuwait (38%) and the United Arab Emirates (36%), and the lowest smoking prevalence among doctors in the United States of America (2%), Australia (3%), the United Kingdom (3%) and Nigeria (3%).[7]

Many studies have shown that when HCWs smoke, this inadvertently undermines their roles in advising or assisting smokers to quit.[8-11] A 2008 Cochrane review demonstrated that simple advice from a doctor about quitting smoking increased the chance of a patient quitting and remaining abstinent for 12 months.[12] Intensive counselling has been shown to increase the chance of quitting, and follow-up support further increases the quit rate.[12] Strategies used effectively to assist smokers to quit their addiction include the use of pharmacological products such as nicotine replacement therapy (NRT), bupropion (Zyban®)[13] and varenicline (Chantix®);[14] behavioural interventions,[15] such as financial incentives; and the use of support groups, quit lines and willpower (cold turkey).

Studies have shown that the majority of smokers also either use or abuse alcohol.[16] The US National Survey on Drug Use and Health (2007) found that among heavy alcohol users, 58.1% had smoked cigarettes in the previous month, while only 19% of non-binge current drinkers and 16.4% of persons who did not take alcohol in the past month were current smokers.[16] Addiction to tobacco and alcohol is multi-factorial, and several studies have suggested an association between genetic, environmental, social and cultural factors and smoking addiction and alcohol use/abuse.[17-20] It has been found that alcohol and nicotine act on the brain via overlapping pathways where dopamine plays a central role.[17] The effect of nicotine on the nicotinic receptors in the brain has been found to indirectly reinforce the actions of both alcohol and nicotine.[17]

There is a paucity of data on the prevalence of smoking and alcohol use/abuse among HCWs in South Africa. This study was conducted to determine the prevalence of smoking and alcohol use among HCWs in KwaZulu-Natal, and their willingness in helping smoking patients to quit.

Method

Research design

This was a cross-sectional descriptive study using self-administered questionnaires to collect data from HCWs on smoking and alcohol use.

Setting

The study was conducted among HCWs in three public hospitals in a health district in KwaZulu-Natal, South Africa. Just over 2000 people from diverse socio-economic backgrounds are employed in these hospitals. Pre-study awareness talks were given at the doctors' clinical meetings and study posters were placed at strategic points around the hospitals some weeks before the commencement of the study.

Sampling

The study population included all doctors, pharmacists and pharmacy assistants, laboratory technologists and laboratory technicians, data capturers, clerks, professional nurses, enrolled nursing assistants, staff nurses, student nurses, radiographers, paramedics, lay counsellors, social workers and clinical orderlies. Some allied medical personnel and non-medical administrative staff were excluded either because of their very small numbers or because they do not have direct patient contact and are thus unlikely to influence patient behaviour. A sample size of 620 was determined by the biostatistician consulted to provide 80% power to detect an estimated study population smoking prevalence of 35% (within 3% precision at 95% confidence).

Nurses and student nurses make up 86% of the staff in the three hospitals and only half of the study sample was selected among them to allow for adequate representation of the other categories of HCWs. Duty rosters were used as a sampling tool to ensure some level of representation of nurses in the study. An effort was made to ensure complete sampling of other HCWs included in the study owing to their small sample size. The paramedics were sampled at their operational bases on several days and weekends over a two-week period.

Ethical considerations

Permission was obtained to conduct this study from the Biomedical Ethics Committee of the University of KwaZulu-Natal (ref. no.: BE 056/09), the respective hospital managers and the KwaZulu-Natal Provincial Health Research Committee (ref. no.: HRKM 032/10). Participants received an information sheet and signed consent prior to the completion of the questionnaires.

Data collection

The primary questionnaire, available in English and IsiZulu, was adapted from a similar questionnaire used by the Centers for Disease Control and Prevention to measure tobacco use and exposure (available from: http://www.cdc.gov/nhcs/data/nhis/tobacco/questions). Demographic data, as well as data on tobacco use and second-hand smoke exposure, and advice and assistance given to smoking patients, were collected. Other variables measured included: how often smoking patients were counselled or assisted, what assistance was offered, and whether the patients were followed up. The secondary questionnaire focused on alcohol use and was based on the 'CAGE' alcohol screening questionnaire. A positive CAGE (two or more yes responses) has a sensitivity of 100% and a specificity of 78% for alcohol dependence among the South African population.[21] The questionnaires were piloted among ten randomly selected HCWs in a regional hospital in Durban and minor modifications were made to the questionnaires before the main study.

The questionnaires were distributed to 650 participants between December 2009 and June 2010 to complete anonymously, on their own. Questionnaires were returned to a locked collection box. Six hundred and twenty questionnaires on tobacco use and 630 questionnaires on alcohol use were returned, giving a response rate of 95% and 97%, respectively.

Statistical analysis

Data were captured and analysed using the SPSS® 15.0 statistical software program. Pearson chi-square tests were used to determine differences between groups. A p-value of less than 0.05 was considered to be statistically significant.

Smoking "pack years" were calculated for current and former smokers by using a calculator downloaded from http://smokingpackyears.com. A smoker who consumes 20 cigarettes daily for one year has one "smoking pack year."[22] A current smoker was defined as anyone who currently smokes any tobacco product on some or all days and a former smoker as anyone who has smoked at least 100 cigarettes in his or her lifetime but who has now quit smoking.[1] A never-smoker was someone who has never smoked cigarettes, cigars or a pipe, or who has smoked less than 100 cigarettes in his or her lifetime.[23] In this study, second-hand smokers were defined as the non-smokers who were constantly exposed to second-hand smoke. Lifetime exposure to second-hand smoke in this study was assessed by obtaining the product of the scale of second-hand tobacco exposure (scale of 1–10) and the duration of second-hand tobacco exposure in years. Participants with less than 50 products were classified as having "light exposure" to second-hand smoke while those with at least 50 products were classified as having "heavy exposure" to second-hand smoke.

Results

Demography

Nurses made up 44% (276) of the sample, and doctors and student nurses made up 15% (94) and 13% (80) respectively. Sixty-seven per cent (418) of the participants were females and 30% (188) were males. Two per cent of the sample did not state their sex. Participants ranged in age from 19 to 71 years (mean age of 35 years and median age of 33 years). The majority of participants were blacks (84%, n = 521), followed by Indians (8.1%, n = 50), whites (4.4%, n = 27), coloureds (2.1%, n = 13) and other races (0.2%, n = 1). The socio-economic status as stated by participants showed that 81.5% were middle class, 12.9% lower class and 4.2% upper class.

Smoking prevalence

Eleven per cent (68) of the participants were current smokers, 7.1% (44) were former smokers and 81.3% (504) had never smoked. One hundred and thirty-five (27%) never-smokers were constantly exposed to second-hand smoke. Male HCWs were thirteen times more likely to be current smokers than their female counterparts (30.3% vs. 2.4%, respectively). More males were former smokers than females (12.8%, n = 24 vs. 4.5%, n = 19, P < 0.001; Table I).

Table I: Smoking status by gender (n = 606)

		Current smoker	Former smoker	Never-smoker	Total	P (chi-square test)
Male	n	57	24	107	188	<0.001
	%	30.3	12.8	56.9	100	
Female	n	10	19	389	418*	
	%	2.4	4.5	93.1	100	
Total	n	67*	43*	496*	606*	
	%	11.1	7.1	81.8	100	

*The sample size reflected in this table is less than 620 owing to missing data

Race was found to have an influence on the smoking status of participants (p < 0.001). Among current smokers, the highest prevalence was among whites, 22.2% (6/27), followed by Indians, 14% (7/50), blacks, 10.2% (53/518), and coloureds, 7.7% (1/13). Among former smokers, coloureds had the highest prevalence, 30.8% (4/13), followed by Indians, 16.0% (8/50), whites, 11.1% (3/27), and blacks, 5.4% (28/518). There was a statistically significant difference (P < 0.001) in prevalence when smoking was analysed according to professional categories. The "other" group, consisting of clerks and data capturers, had the highest current smoking rate of 27.3% (3/11). This was followed by allied health workers, 16% (25/156), doctors, 11.7% (11/94), nurses, 8% (22/276), and lastly student nurses with the lowest rate, 7.5% (6/80). Paramedics, when separated from allied health workers, had a very high smoking rate at 31.7% (13/41; Table II).

There were considerable differences in smoking prevalence between socio-economic groups but this marginally failed to be statistically significant (P = 0.052). Those in the lower socio-economic group had the highest current smoking rate at 20.0% (16/80). This was more than twice the rate among those in the middle income group, 10% (50/502). The upper socio-economic group had the lowest current smoking rate at 3.8% (1/26), about a fifth of the rate in the lower group.

Exposure to primary and second-hand smoking

Former smokers had a mean duration of tobacco use of 9.65 years (range 1–46) and they used an average of six

Table II: Smoking status by professional categories

			Current smoker	Former smoker	Never-smoker	No response	Total	P (chi-square test)
Category of health care worker	Doctor	n	11	15	68	0	94	
		%	11.7	16.0	72.3	0	100	
	Nurse	n	22	13	238	3	276	
		%	8.0	4.7	86.2	1.1	100	
	Student nurse	n	6	2	72	0	80	0.003
		%	7.5	2.5	90	0	100	
	Allied health care worker*	n	25	12	118	1	156	
		%	16	7.7	75.6	0.6	100	
	Other	n	3	2	6	0	11	
		%	27.3	18.2	54.5	0	100.0	
	Not stated	n	1	0	2	0	3	
		%	33.3	0	66.7	0	100	
Total		n	68	44	504	4	620	
		%	11.0	7.1	81.3	0.6	100	

*Allied health workers (156): paramedics (41), lay counsellors (32), clinical orderlies (25), pharmacists (12), pharmacy assistants (12), laboratory technologists (17), laboratory technicians (3), radiographers (11), and social workers (3)

cigarettes per day (range 1–30). The mean pack years in former smokers was 5.22 pack years (range 0–35). Among current smokers the mean duration of tobacco use was 14.1 years (range 1–35) and their average daily use was 8.6 cigarettes per day (range 1–20). The mean pack years for current smokers was 6.22 pack years (range 0–20).

A substantial group (27%, 135/504) was categorised as second-hand smokers because they were constantly exposed to second-hand smoke. Among this group, 92 respondents (68%) were found to have had heavy lifetime exposure to second-hand smoke. Exposure to second-hand smoke was most common at home (31%, 156/504), when using public transport (29%, 145/504), at work (23%, 119/504), in restaurants (21.4%, 108/504) and in pubs (14.5%, 73/504).

Disease conditions associated with tobacco use

An irritating cough was more common among current smokers (26.5%, 18/68) and former smokers (16%, 7/44) than among never-smokers not constantly exposed to second-hand smoke (9.8%, 36/369). Among second-hand smokers irritating cough was a problem in 12.6% (17/135). A chronic cough was more commonly reported by current smokers (5.9%, 4/68) compared to that reported by former smokers [4.5% (2/44), $P < 0.001$]. It was also a problem in 2.2% (3/135) of second-hand smokers. Eleven per cent (5/44) of former smokers, 5.9% (4/68) of current smokers and 4.4% (6/135) of second-hand smokers complained of excessive sputum production ($P < 0.001$). Heart disease was reported in 4.4% (3/68) of current smokers, 2.3% (1/44) of former smokers, 4.1% (15/369) of never-smokers not constantly exposed to second-hand smoke and 2.2% (3/135) of second-hand smokers (Table III).

Helping smokers to quit

Never-smokers more frequently counselled and educated their smoking patients to quit than former and current smokers did (47.5% vs. 39.5% vs. 25.8% respectively, $P = 0.001$). Twenty-four per cent (16/68) of current smokers never educated nor counselled their smoking patients to quit. Only 22.3% (138/620) of HCWs in this study had followed up on their smoking patients whom they had counselled or assisted to quit. Follow-up of patients did not differ significantly among the smoking categories. Seventeen per cent of participants (104/620) recommended the use of support groups to smoking patients. Help through the Employee Assistance Programme (EAP) was offered to smoking patients by only 3.9% (24/620) of the respondents.

The largest portion of the HCWs who offered counselling (18.5%) recommended a spectrum of modalities, including methods such as cold turkey (willpower), Zyban®, drinking a lot of water, eating sweets, and education on the health risks of smoking and the benefits of quitting. Among the nicotine replacement therapies offered, nicotine gum was offered to smoking patients by 12.3% (76/620) of participants. This was followed by nicotine lozenges by 7.4% (46/620), nicotine patches by 5.3% (33/620), nicotine sprays by 3.4% (21/620) and nicotine inhalers by 2.3% (14/620).

Table III: Disease conditions associated with tobacco smoking

Disease conditions		Smoking status				P (chi-square test)
		Current smoker (n = 68)	Former smoker (n = 44)	Never-smoker (n = 504)		
				Not constantly exposed to second-hand smoke (n = 369)	Constantly exposed to second-hand smoke (second-hand smokers) (n = 135)	
Irritating cough	n	18	7	36	17	< 0.001
	%	26.5	15.9	9.8	12.6	
Chronic cough	n	4	2	5	3	
	%	5.9	4.5	1.4	2.2	
Excessive sputum production	n	4	5	7	6	
	%	5.9	11.4	1.9	4.4	
Asthma	n	4	5	24	14	
	%	5.9	11.4	6.5	10.4	
Chronic lung disease	n	1	0	4	3	
	%	1.5	0	1.1	2.2	
Heart disease	n	3	1	15	3	
	%	4.4	2.3	4.1	2.2	
Hypertension	n	8	3	36	17	
	%	11.8	6.8	9.8	12.6	
Any form of cancer	n	2	1	5	1	
	%	2.9	2.3	1.4	0.7	

Alcohol use problems

Just more than half of the respondents (53.6%, 338/630) admitted to having used alcoholic beverages. Fifty per cent of males (99/197) and 14% of females (6/429) reported using alcohol very often. The study showed that males were ten times more likely to drink excessively than females (20.8% vs. 1.9%, P < 0.001). The majority of current smokers (73%) admitted to using alcohol very often, while 51.3% of former smokers and 17.3% of never-smokers reported using alcohol very often. Current smokers were six times more likely to drink excessively when compared to never-smokers (27.8% vs. 4.7%, P < 0.001). Using the CAGE questionnaire to determine the presence of alcohol use problems, 22.4% (141/630) of participants reported to have had or have alcohol use problems (they gave a "yes" answer to two or more CAGE questions; Table IV).

Table IV: Summary of the CAGE* questionnaire on alcohol use problems among participants

Alcohol use problem: Absent or present with CAGE questionnaire?	Frequency	%
Negative or absent (< 2 yes answers)	489	77.6
Positive or present (≥ 2 yes answers)	141	22.4
Total	630	100.0

*CAGE is an acronym that stands for: **C**, felt like **cutting** down; **A**, **annoyed** at criticisms; **G**, felt **guilty** about drinking; **E**, needed alcohol as an **eye**-opener first thing in the morning

Discussion

The rate of smoking among HCWs in this study (11.0%), although lower than the national average of 21.4% reported in 2003,[5] is higher than their counterparts in many parts of the world. There are as yet no other documented tobacco use studies among HCWs in South Africa to which to compare the findings in this research. Females are over-represented in the study sample (67% were females) and, as they smoke significantly less than males, the gender bias reduced the overall prevalence of smoking in the study population. When the smoking prevalence is analysed by gender to eliminate the effect of gender bias, it could be seen that there is a small difference in the male smoking rate in this study compared to the male population in 2003 (30.3% vs. 35.8%) and a significant decrease in female smoking rate compared to the female population in 2003 (2.4% vs. 8.1%).

The smoking rate among the paramedics (31.7%) is high and a cause for concern. The study did not explore whether the paramedics smoked inside the ambulances while waiting or transporting patients, nor the reasons why a high number of them smoke. It could be as a result of the stressful nature of their work. The effect of stressful work on smoking was determined in a study among 1100 Australian workers. Men who work more than 50 hours per week are more than twice as likely to smoke as their counterparts working usual full-time jobs. This risk is

further doubled if their work is stressful.[24]

The rate of smoking of 11% (11/94) among doctors in this study is higher than the rate reported in most of the Western world and Nigeria, but lower than that among doctors in Greece, China, Japan and some Gulf countries.[7,27,30]

Participants in the lower socio-economic class have the highest smoking prevalence of 20% (16/80), compared to the rate of 9.9% (50/505) among the middle class and 3.8% (1/26) among the upper class. This finding is similar to the trends seen in Australia, where individuals in the lower socio-economic group had a higher smoking rate of 26.0%, compared to 13.0% in the upper socio-economic group.[25]

Although the sample size used in this study is small, results show that the conditions associated with smoking, such as an irritating cough, a chronic cough, heart disease, hypertension and cancers, are more prevalent in current smokers when compared to former and never-smokers. This is consistent with the findings reported in the literature, namely that tobacco use is strongly associated with these conditions.[26,27]

In the current study, excessive sputum production and asthma were notably higher in former smokers than in current and second-hand smokers. The reason/s for this was not ascertained.

Despite the legislative ban on smoking in public places in South Africa,[28] this study showed that many never-smokers are still exposed to second-hand smoke. This suggests poor enforcement of the ban on smoking in public places in the district where the study was conducted. The high exposure to second-hand smoke in the home is a cause for concern as exposure to environmental tobacco smoke increases the risk of serious respiratory problems in children[26] and there is strong evidence from studies that passive smoking, especially by the mother, is responsible for sharp increases in sudden infant death syndrome.[29] In non-smoking adults, passive tobacco smoke has been found to cause lung cancer and coronary heart disease.[26] Disease conditions associated with smoking were common among participants classified as second-hand smokers in this study. Although these findings are not statistically significant, given the small sample size and design of this study, they are consistent with the findings in other studies, which associate second-hand tobacco exposure with most of the health risks associated with active smoking.[26,27]

Of concern is that only 54.7% of all participants offered advice on products available to help smoking patients who wanted to quit, and only 22.5% of participants followed up on their smoking patients whom they had advised or assisted to quit. This means that HCWs were failing in their expected roles in reversing the tobacco epidemic. Although follow-up of smoking patients in the public hospitals may appear difficult because patients are not always seen by the same HCW on their follow-up visits, tobacco cessation efforts (if documented in the patient's file) could alert the next HCW to reinforce the previous counselling/assistance given.

The finding in this study that never-smokers were more likely to counsel and educate their smoking patients to quit than former and current smokers is consistent with findings from other studies.[12]

It could not be ascertained from this study whether the smoking cessation products were merely suggested to patients or were actually prescribed and supplied. The availability of such products was also not ascertained. The most common strategies offered by 18.5% of participants was going "cold turkey", and nicotine replacement therapies were not commonly offered to smoking patients.The study did not explore the reasons for these findings. It was, however, noted that a few HCWs recommended nicotine inhalers and sprays that are not available in South Africa to patients, which brings into question the validity of some responses. Furthermore, the support groups recommended to patients by HCWs are not strictly smoking cessation support groups, but are general support groups available at the hospital. All these issues mentioned need to be explored in a follow-up study.

The high number of smokers who also reported excessive alcohol use is cause for concern. Although these results are based on an anonymous study from one district in South Africa, they are in keeping with results of international studies that suggest that smokers are more likely to use/abuse alcohol and that they become intoxicated more often than former smokers and never-smokers.[16,18,20] Almost a quarter of the participants reported alcohol-related problems, indicating an urgent need for further exploration and strategies to address the problem among HCWs. Urgent interventions at each hospital, through their EAP, should particularly target male HCWs, who are ten times more likely to abuse alcohol than females. This intervention is expedient in view of the short- and long-term risks of alcohol use/abuse, which include impairment of functioning, violence, unintentional injuries such as traffic accidents, alcoholic hepatitis and cirrhosis.[30]

Bias and limitations

Incomplete entries and non-return of questionnaires may have affected the validity of some of the analysis.

There were no clear definitions of what constitutes being slightly drunk or heavily drunk, nor of socio-economic status. Some HCWs may have given socially acceptable answers, such as offering patients nicotine replacement therapies that are nevertheless not available in South Africa, thus introducing systematic bias to the results. Owing to the small number of responses to some of the variables studied, statistical analysis of significance and generalisation should be treated with caution for those variables. The sampling strategy may also have introduced bias as nurses are under-represented in the sample. Furthermore, 69% of the study sample are women and this may have biased the results on overall smoking prevalence and alcohol use as women are less likely to use tobacco and alcohol than men.

Conclusions and recommendations

Smoking by HCWs undermines their moral high ground in the fight against the tobacco epidemic. There is also a very high exposure of non-smokers to second-hand smoke, especially at home. The high exposure to second-hand smoke in public places, including the hospital premises, suggests that the smoking ban in public places is not effectively enforced. The authorities should ensure that the smoking bans in public places are strictly enforced.

This study showed that alcohol use is common among HCWs. This is of particular concern because of the impact that alcohol misuse has on productivity and health. Alcohol use among HCWs needs further study and the EAP needs to be proactive in identifying and dealing with alcohol use problems among hospital staff. It is also necessary to explore further, in a follow-up study, why a large number of paramedics smoke and whether they smoke inside the ambulances. Availability of smoking cessation products in the hospitals and the level of utilisation also need to be investigated.

HCWs need to educate patients on the harmful effects of smoking and support those willing to stop smoking. Follow-up should be arranged for such patients and proper documentation of the smoking cessation assistance recorded in the patient's file for continuity of care.

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