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Perceptions of students regarding the effects of the implementation of the tobacco control act of 1999 on a South African University campus

M.W. Khan^a, V. Hira^a  and F. Haffejee^{a*}

^aDepartment of Basic Medical Sciences, Durban University of Technology, Durban, South Africa

*Corresponding author, emails: firozah@dut.ac.za, haffejeef@gmail.com

Background: Smoking among adolescents is high. In order to curb the habit, restrictions on use of tobacco products in public places were implemented in South Africa. This study aimed to explore students' perceptions of whether the implementation of smoking restrictions and no-smoking signs have had any effects on smoking behaviours on campus.

Methods: A quantitative cross-sectional study was conducted amongst university students, who completed a self-administered questionnaire.

Results: Students were aware that smoking causes disease and that second-hand smoke is dangerous. The majority were pleased that there was a smoking regulation in effect, but disagreed that it created a healthier atmosphere. Many would like a total ban enforced in restaurants, clubs, bars and university campuses. They felt that there were insufficient non-smoking signs in public areas. Many smokers stated that they ignored regulations and only a minority stated that the policy encouraged smokers to quit.

Conclusion: Smoking among students has decreased over the years. This has been accompanied by an increase in knowledge of the harmful effects of smoking. Regulations have thus had a positive effect; however, additional efforts are required to motivate more people to quit smoking altogether and to prevent young people from taking up the habit.

Keywords: smoking, smoking regulations, South Africa, tobacco control act, university students

Introduction

Tobacco smoking is the leading cause of preventable illness and death in developed countries and the third leading cause of death in South Africa, where 38% of adolescents have tried smoking.¹ It has led to an increased prevalence of cardiovascular diseases, cancer and respiratory problems.^{2,3}

Due to these adverse effects on health, restrictions on the use of tobacco products in public places were implemented in South Africa by the enactment of the Tobacco Products Control Amendment Act of 1999 (TPCAA), which limited smoking to certain areas of restaurants, clubs, shopping centres and other public places.⁴ This law, which prohibited smoking in the general area of these public places, was predominantly for the well-being of second-hand smokers and did not encourage people to stop smoking altogether.⁵ It was thus not accompanied by an educational campaign to raise awareness of the detrimental effects of smoking on health.⁶

In 2005, the amended TPCAA raised the legal age of buying tobacco products from 16 to 18 years. It also made it illegal to smoke in a car with a child under the age of 12 years.⁷ Furthermore, it implemented anti-smoking media campaigns, and health warnings on tobacco products.⁸ Notwithstanding this, smoking has not been completely banned at tertiary institutions in South Africa but no-smoking signs are present at entrances to all buildings and even along stairwells. The perceptions of South African students concerning the implementation of smoking restrictions and no-smoking signs on university campuses are as yet unknown. This study aimed to explore students' perceptions of whether the implementation of smoking restrictions and no-smoking signs have had any effects on smoking behaviours on campus.

Methods

A quantitative cross-sectional study was conducted from February to May 2015 amongst students attending a tertiary institution in Durban, KwaZulu-Natal, South Africa. Questions were compiled from established literature within the field.^{9,10} The questionnaire included items on tobacco use and exposure as well as knowledge of and attitudes towards smoking. Current and ex-smokers were also required to answer a section on smoking behaviour and cessation. Demographic information was requested from all participants. The questionnaire comprised 60 questions and took approximately 15 min to complete. Attitudes on several statements were assessed using responses along a five-point Likert scale (strongly agree to strongly disagree).

The surveys were reviewed thoroughly by the study team and subsequently piloted for reliability to ensure that language was appropriate for the local context prior to administration. Using a total student population of 22 303, a confidence level of 95% and a confidence interval of 5%, a minimum required sample size of 384 was calculated. As we expected an approximate return of 85%, a total of 450 questionnaires, in the English language, were distributed. Students, 18 years and older, registered for full-time studies at all levels, were recruited by convenience sampling at several locations (e.g. outside the library, cafeteria and lecture halls) on three Durban-based campuses of the Durban University of Technology. Students who were in the above-mentioned areas were approached by members of the study team and invited to participate in the study. Those interested were provided with a written information letter and any queries were addressed. Signed consent was provided by all participants prior to answering the self-administered questionnaire. Confidentiality was maintained and no identifying information was collected on

Table 1: Demographics of study population

Item	Total 100% (n = 386)	Smokers 19.6% (n = 76)	Ex-smokers 10.1% (n = 39)	Non-smokers 70.2% (n = 271)
Age group (years)				
18	22.4 (86)	15.1 (13)	5.8 (5)	79.1 (68)
19-24	69.8 (266)	19.5 (52)	11.6 (31)	68.7 (183)
> 25	7.8 (30)	34.5 (10)	6.9 (2)	58.6 (18)
Gender				
Male	54.4 (211)	30 (63)	11.4 (24)	58.5 (123)
Female	45.6 (176)	7.4 (13)	8.6 (15)	84 (148)
Ethnicity				
African	66.6 (255)	16.5 (42)	11.8 (30)	71.7 (183)
Coloured	3.6 (14)	21.4 (3)	14.3 (2)	64.3 (9)
Indian	22.8 (87)	28.7 (25)	3.4 (3)	67.8 (59)
White	7.0 (26)	19.2 (5)	11.5 (3)	69.2 (18)

Note: All sub-categories do not total 386 as some participants chose not to answer some questions.

Table 2: Knowledge of the effects of smoking on health

Knowledge of the hazardous effects of smoking	% (n)
I have been informed about the dangers of smoking	90.8 (357)
Smoking causes cancer	89.6 (352)
Smoking causes lung disease	88.5 (348)
Smoking causes heart disease	76.6 (301)
Smoking can aggravate tuberculosis	74.6 (293)
Smoke from other people's cigarettes is harmful to me	73.5 (289)

the survey document. Completed questionnaires were collected in a sealed ballot box separate from the signed consent forms. The study was approved by the Institutional Research Ethics Committee of the Durban University of Technology (IREC 009/15).

All quantitative data were analysed using the SPSS® statistical package (version 23.0) (IBM Corp, Armonk, NY, USA). Likert-scale analysis was performed to analyse responses. The 'strongly agree' and 'agree' categories were collapsed and the frequency of agreement subsequently calculated. Similarly, the 'strongly disagree' and 'disagree' categories were collapsed for the calculation of frequency of disagreement. Thus the final analysis was performed on a three-point Likert scale with the categories of 'agree', 'unsure' and 'disagree'. Where applicable, a chi-square test or Fisher's exact test was used to determine the significance of relationships between variables. A *p*-value of < 0.05 was considered statistically significant.

Results

The demographic details of respondents are given in Table 1. A total of 393 respondents completed the questionnaire. There were more males (54.4%) but this gender difference was not significant (*p* = 0.09). Most respondents were Black African (66.6%), followed by Indian (22.8%), White (7.0%) and those of mixed race (3.6%).

The majority of the respondents (70.2%) were non-smokers, 19.6% were current smokers while 10.1% were ex-smokers. Half

of the respondents (50.4%) reported not living with any smokers in their household. More than half of the respondents (61%) stated that they have tried a cigarette at some time in their life. The age group of 17 to 19 years was the most common for first trying a cigarette (36%), followed by the 14- to 16-year age group (28%). There was no difference between smoking status among the different ethnic groups (*p* = 0.121). The average duration that respondents had smoked was 4.6 ± 3.2 years.

The most common reason for starting to smoke was because 'it seemed fun' (31.3%). The main reason for currently smoking was stress (42.0%), followed by the perception of smoking being 'cool' (23.0%) and peer pressure (22.0%). People with smokers in their household were more likely to be current or ex-smokers than people with no smokers in their household (*p* < 0.001). Smokers were also significantly more likely to have been exposed to second-hand smoke at home in the past seven days (*p* = 0.003).

Significantly more males (30.0%) smoked than did females (7.4%; *p* < 0.001); however, there was no difference in the number of cigarettes smoked between the genders (*p* = 0.62). Over a third of the smokers (38.3%) smoked 2 to 5 cigarettes a day and almost another third smoked 6 to 10 a day (31.3%) while 16.5% smoked only one a day. A further 10.4% smoked between 10 and 20 cigarettes a day and 3.5% smoked more than 20 cigarettes a day. The majority of smokers did not smoke indoors (72.8%). Almost two-thirds of the respondents (62.3%) reported exposure to second-hand smoke at university, more than half (57.5%) were exposed in public places and only 26.0% at home. Current and ex-smokers were also significantly more likely to have tried or experimented with other smoked tobacco products as opposed to their non-smoking counterparts (*p* < 0.001).

Table 2 shows that there was a high level of knowledge of the harmful effects of smoking. The majority (90.8%) of respondents were aware of the dangers of smoking. They were aware that smoking causes cancer (89.6%), lung disease (88.5%), heart disease (76.6%) and that it can aggravate tuberculosis (74.6%). They were also aware that second-hand smoke was dangerous (73.5%).

Table 3 illustrates the perceptions regarding the smoking policy. The majority of participants were pleased that there was a smoking regulation in effect (70.2%) but less than a third (30.1%) agreed that the regulation created a healthier atmosphere. Almost a third stated that a ban on all smoking should be extended to all restaurants, whereby smoking should not be allowed in any restaurant even within designated smoking areas (65.6%), and almost half would like total smoking bans in all clubs, bars and pubs as well (44.3%). Over half (58.1%) stated that a ban should be implemented on all university campuses, while only 14.6% thought that the current regulation at university is well enforced. Many thought that there are insufficient no-smoking signs in public areas (42.2%).

There was only a marginal difference in the perception of the regulation between smokers, ex-smokers and non-smokers, with more ex-smokers and non-smokers being pleased with the smoking regulation than current smokers (*p* = 0.046). Significantly more non-smokers and ex-smokers also thought that there should be a complete smoking ban in restaurants, clubs/bars and across all university campuses (*p* < 0.001).

Only 19.6% indicated that the policy encouraged smokers to quit. The regulation has also had little impact on the number of

Table 3: Attitudes towards the smoking policy

Factor	n (%)
Perception of the regulation	
I am pleased that the smoking regulation has been introduced	70.2 (271)
The regulation on public smoking has helped create a healthier atmosphere	30.1 (116)
There should be a smoking ban in all restaurants	65.6 (256)
There should be a smoking ban in all clubs/bars/pubs	44.3 (171)
There should be a smoking ban on all university campuses	58.1 (222)
Effect of the ban on perceived smoking behaviour	
The regulation on smoking has encouraged smokers to quit smoking	19.6 (76)
Since the smoking regulation was implemented, less people are seen smoking in restaurants	30.8 (120)
Since the smoking regulation was implemented, less people are seen smoking in public places	20.8 (81)
Since the smoking regulation was implemented friends/family members have decreased the number of cigarettes they smoke	27.1 (105)
Since the smoking regulation was implemented many friends/family members have stopped smoking	14.9 (58)
Perception of smokers on cessation and the ban	
I would like to stop smoking right now	53.5 (54)
I have tried to quit smoking in the past	71.2 (74)
The smoking regulations made me stop smoking altogether	13.7 (14)
The smoking regulations made me decrease the number of cigarettes smoked	32.0 (33)
The smoking regulations have had no effect on my smoking habit	39.6 (40)

people seen smoking in restaurants (30.8%) and public places (20.8%). Almost two-thirds (63.5%) of smokers stated that they smoke anywhere on campus therefore ignoring the regulation, as opposed to 21.7% who smoke outside, but within campus grounds. The remainder smoke away from campus. Over a quarter (27.1%) reported that the regulation has decreased the number of cigarettes smoked by family members or friends, and only 14.9% reported a complete cessation of smoking by family and friends.

Most ex-smokers stopped smoking 2.0 ± 3.0 years ago. The main reason for quitting smoking was personal health (62.9%) followed by the high cost of smoking (19.2%). Only 13.7% attributed their cessation to the smoking policy. However, almost a third (32.0%) of the current smokers reported a decrease in number of cigarettes due to the regulation while 39.6% said the regulation had no effect on their smoking behaviour.

Over half of the current smokers (53.5%) wished to stop smoking henceforth, and many (71.2%) said that they have tried to quit in the past but failed. A few (17.5%) had tried nicotine replacement therapies in an attempt to stop smoking and 23.3% had tried e-cigarettes as a substitute.

Discussion

Smoking amongst university students has been a concern due to its effects on health. Developing countries have a large prevalence of smokers with resultant bans and anti-smoking campaigns in an attempt to curb the habit.⁸ This study determined students' perceptions of the effect of implementation of smoking restrictions and no-smoking signs on smoking behaviours. The majority of students had a high level of

knowledge concerning the harms of smoking, supported the smoking regulations and would like a total restriction of smoking in all indoor public places. Our finding of a prevalence of 19.6% of student smokers is lower than a previous report from 2006 where the prevalence of smoking among South African students was 26%.¹¹ This would be due to the awareness of the health risks posed by smoking and possibly also due to the high cost of cigarettes as many ex-smokers reported that they stopped smoking either because of health reasons or because of the high cost of smoking.

Study participants showed a considerable knowledge of the adverse effects of smoking and the amount of knowledge has increased since a previous study conducted in 2000 and 2006.^{11,12} A substantially higher proportion of young people are now aware of the risk of heart disease (77%) compared with previously (30%).¹² Whilst, in 2000, 70% of people were aware that smoking causes cancer,¹² this number has now increased to 89%. The amendment to the TPCAA (in 1999) promoted the knowledge of the dangers of smoking with the requirement of warning labels on cigarette packages. The higher numbers of young people currently aware of the dangers of smoking attests to these warning labels having some impact on them. Much like first world countries, the younger generation could, knowing the hazardous effects of smoking, be less likely to start smoking, which also explains the decrease in its prevalence.

It is nevertheless disturbing that approximately a quarter of the respondents reported not knowing that smoking causes heart disease and that it aggravates tuberculosis. Health-education programmes need to be enhanced so that this knowledge reaches all people. It can perhaps be added to school curricula so that it directly targets young people at an age when they are vulnerable to commence smoking. Education programmes must also include information on the harmful effects of secondary smoke as many are unaware of this.

The perception towards the regulations on university campus was positive in that most students were happy that these were implemented and wanted them applied in other environments as well. Signage at university differs around various buildings. While these signs are present at the entrance to main buildings and lecture venues, there are none near the cafeteria and eating areas, which are places where students gather during their free time. The areas around the offices of the university staff also have little or no signage. We propose a more uniform distribution of no-smoking signs as well as the allocation of specific smoking areas for smokers. The smoking areas should be a considerable distance away from lecture venues, cafeterias and offices. They should preferably be in an open space that is not in parking areas or walkways and that is a large distance away from buildings and gardens in order to create a healthier atmosphere. It is also anticipated that the inconvenience of walking to these areas will help decrease the number of cigarettes smoked and/or eventually result in cessation. Previous reports have shown that the inconvenience placed by smoking restrictions reduced smoking in adults.¹³ In addition, this will ensure that those who do not smoke are protected from the harmful effects of secondary smoke.

Despite the presence of no-smoking signs on university campuses, most students were exposed to second-hand smoke at university. As the signs are often ignored, stricter control needs to be maintained so that regulations can be enforced. It is also important that smoking should not be allowed in and outside cafeterias, outside lecture venues and entrances to

buildings. Nevertheless, having laws in place will on their own not be sufficient; enforcement of these laws is also required. In our study, the majority of the responses were accompanied by dissatisfaction regarding the enforcement of the regulation, and not believing that the regulation had resulted in a reduction of smokers. Indeed, the majority of smokers also reported smoking anywhere in and around campus, therefore being noncompliant with the policy. A stricter approach and better enforcement is thus necessary for the policy to be effective. Campus security should be strict in enforcing this law. Those breaking it can initially be given warnings and, if these fail, fines need to be imposed. Such law enforcement is also required in public areas outside university. Smokers often exit the buildings and smoke close to the entrances, therefore exposing others in those areas to second-hand smoke. Consequently, the regulation does not have the intended effect. Students would like to see more no-smoking signs in public places and this should be both on university campuses and in other public places as well. The TPCAA has restricted smoking to certain areas of restaurants, bars and clubs but this is still not sufficient in protecting non-smokers from the harmful effects of smoking and many have indicated that they would like to have a complete ban on smoking in these places. It is particularly noteworthy that more non-smokers would like this extension to the ban. These findings corroborate previous reports where American college students also supported a total ban of smoking in restaurants.¹⁴ In the latter study the support for the ban was particularly high amongst those who were studying towards future employment in the hospitality industry and hoped to work in a smoke-free environment, as they were also aware of the harmful effects of second-hand smoke.¹⁴ The intent of bans is to stop public smoking. This has to be aided with educational material and a campaign to ensure that adolescents do not start the habit as they are very vulnerable at that age. The World Health Organization also noted that people who do not initiate the habit before the age of 20 are less likely to start smoking.¹⁵

Moreover, campaigns that portray smoking in a bad light may be useful in preventing young people from taking up smoking since many started the habit as they thought it 'seemed fun'. In order for health education and knowledge of the harmful effects of smoking to be a driver of change, priority needs to be the prevention of smoking in young people. Previous reports show that mass media campaigns that target the young are effective in preventing the uptake of smoking in young people and that these campaigns which portray smoking in a bad light should include multiple channels of communication such as newspapers, television, radio, posters and information booklets.¹⁶ Our finding that the teenage years are the most likely age when people start smoking is supported by a similar study in 2005.¹⁷ Stress was the most common reason mentioned for commencement of smoking. We therefore propose that health education on the harmful effects of smoking must begin at secondary or even primary school level. It should focus not only on the harms of smoking but also teach stress coping mechanisms as well as other means of alleviating stress, for example through exercise. It must also be noted that whilst smokers report that smoking relieves stress, the actual stress levels are higher in smokers than in non-smokers.¹⁸ There is also a worsening of moods among smokers.¹⁸

It is encouraging that over half the smokers wished to quit; however, a large proportion tried to quit smoking but failed. Withdrawal symptoms were a common reason for failure to quit.⁴ Another common cause for failure to quit was being in the

company of other smokers, which eventually led to resuming the habit. This is due to the social aspect of smoking, which during adolescence is a crucial motivating factor for smoking.¹⁹

Whilst many have tried to quit smoking in the past, they were unsuccessful but would like to stop doing so. However, more than a third of smokers indicated that the smoking regulations have had no effect on their smoking behaviour. Thus further restrictions on smoking are necessary, particularly those preventing smoking in public areas. Tobacco control programmes should be tailored to motivate people to stop smoking. Although health warnings are present on cigarette packaging these are clearly being ignored. An environment that reiterates these health warnings may be beneficial. We propose the placing of health warnings regarding smoking on bill-boards along main roads. Additionally, these warnings should include pictures of organ damage caused by tobacco smoking. Furthermore, publicising these in newspapers and magazines would be valuable. The more often people are confronted by warnings, particularly those that include visual effects, it may be hoped that this would have a meaningful impact on the cessation of smoking. Moreover, an environment that is supportive of non-smoking is required in order to decrease smoking behaviour when socialising. Signs in parks and gardens can designate these areas as non-smoking areas and in addition billboards in these areas can promote clean, green spaces with the benefits of smoke-free air. These non-smoking open spaces need to be extended to university grounds, which should also be designated as no-smoking areas.

We also show that living with at least one smoker in the household predicates smoking behaviour. In addition, this is also harmful due to the effects of second-hand smoke. Exposure to peers and family members who smoke has also previously been shown to make youngsters more likely to take up smoking.¹⁵ Indeed, we also confirm that a correlation exists between a higher number of smokers in the household and taking up smoking. Attempts need to be made to discourage people from smoking in their homes. As this would be difficult to monitor, campaigns need to emphasise the effects of smoking in the presence of children so that parents can make a conscientious effort not to smoke in the company of their children. Furthermore, our study showed smokers and ex-smokers were also more likely to have experimented with other smoked substances such as drugs, thus causing more harm to their health. This corroborates with the findings of a study stating that smokers have a greater tendency towards participating in risky behaviour.²⁰ We found that the use of nicotine replacement therapies was extremely low even though these are easily accessible. Perhaps the use of these should be more widely advertised or encouraged in non-smoking campaigns. The more recent e-cigarettes, which are supposed to assist in quitting of smoking, have not been around long enough to assess their effects on long-term health and should not necessarily be encouraged.

A limitation of the study is that a convenience sample was used and it is therefore uncertain whether our results can be generalised to all students or to other populations. Future studies would be enhanced if students were selected from different academic levels of study as this may have an effect on smoking behaviour. Second, despite data collection through a self-administered questionnaire, our results may have been prejudiced by social-desirability bias. Future research also needs to ascertain the time of smoking cessation and reasons thereof.

Conclusion

Students perceived several favourable effects of the smoking restrictions and no-smoking signs. However, reports that the tobacco control act has had little impact on smoking in public places and that no-smoking signs are ignored on campus signify the need for tougher enforcement of the regulations among students at higher institutions of learning in South Africa. Additional efforts are required to motivate more people to quit smoking altogether and to prevent young people from taking up the habit.

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