Awareness and perception of blindness related to smoking among Nigerian undergraduates

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Original Article

ABSTRACT

Background: Although evidence now exists to show that smoking is a major risk factor for common sight-threatening conditions, there is a worrying lack of awareness of blindness as a smoking-related condition among the public.

Objective: To determine the awareness and perception of blindness related to smoking as compared to other known smoking related conditions among Nigerian undergraduates.

Method: This was a cross sectional survey carried out in the University of Benin, Nigeria between January and June, 2013. Three thousand five hundred closed-ended questionnaires were distributed among ten faculties in the University. Participants were asked in the questionnaires about their awareness of a link between blindness and smoking as relates to other smoking-attributable conditions like lung cancer, heart disease and stroke.

Results: Three thousand questionnaires (85.7%) were returned properly and completely filled from the ones sent out. Study respondents comprised of 1848 (61.6%) male students and 1152 (38.4%) female students aged 16 to 30 years (mean 22.1±2.1 years). The number of students who believed smoking definitely or probably caused lung cancer, stroke and heart disease was 2760 (92%), 2253 (75.1%) and 2577 (85.9%), respectively. About half of the study population 1488 (49.6%) believed smoking can cause blindness as compared to 423 (14.1%) who believed it can cause deafness. The difference between those who believed that blindness can be caused by smoking and those who believed smoking can be a cause of the other attributable conditions was significant ($p<0.001$).

Conclusion: The awareness of the risk of blindness from smoking is less than other known smoking related conditions. Publicizing this risk might help reduce prevalence of smoking.

Keywords: Blindness, smoking, lung cancer, heart disease, stroke.

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La sensibilisation et la perception de la cécité liée à la consommation de tabac chez les étudiants nigérians

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L'article d'origine

Résumé

Rappel des faits: Bien que la preuve existe maintenant de montrer que le tabagisme est un facteur de risque majeur de vue commune des conditions menaçant, il y a un manque inquiétant de la prise de conscience de la cécité comme un tabagisme condition parmi le public.

Objectif: déterminer la conscience et la perception de la cécité liée au tabagisme, comparativement à d'autres connus liés au tabagisme conditions parmi les étudiants nigérians.

Méthode: Il s'agit d'une enquête transversale menée à l'Université du Bénin, Nigéria entre janvier et juin 2013. Trois mille cinq cents fermées, des questionnaires ont été distribués parmi les dix facultés de l'université. Les participants ont demandé dans les questionnaires sur leur conscience d'un lien entre la cécité et le tabagisme comme lié à d'autres fumeurs-imputables conditions comme le cancer du poumon, les maladies du coeur.

Résultats: Trois mille questionnaires (85,7 %) ont été retournés correctement et complètement remplis de celles envoyées. Les répondants à l'étude composé de 1848 (61,6 %) les étudiants de sexe masculin et 1152 (38,4 %) les étudiantes âgés de 16 à 30 ans (moyenne 22,1 ± 2,1 ans). Le nombre d'étudiants qui pensent que le tabagisme certainement ou probablement causé le cancer du poumon, les maladies cardiovasculaires et les maladies du coeur a 2760 (92%), 2253 (75,1 %) et 2577 (85,9 %), respectivement. Environ la moitié de la population de l'étude 1488 (49,6 %) sont d'avis que le tabagisme peut entraîner la cécité, comparativement à 423 (14,1 %) qui estiment qu'il peut provoquer la surdité. La différence entre ceux qui estimaient que la cécité peut être causée par le tabagisme et ceux qui pensaient que le tabagisme peut être une cause de l'autre imputables conditions était significatif ($p<0.001$).

Conclusion: La prise de conscience du risque de cécité due au tabagisme est inférieur à celui des autres connus liés au tabagisme conditions. Faire connaître ce risque pourrait contribuer à réduire la prévalence du tabagisme.

Mots-clés: cécité, le tabagisme, le cancer du poumon, les maladies cardiaques, les accidents vasculaires cérébraux.

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INTRODUCTION

Tobacco smoking is a major risk factor for many chronic diseases but the effects of smoking on the eye are not well recognized (1). In recent years, blindness has emerged as an important effect of smoking. Notably, smoking has been linked to Age-related Macular Degeneration (AMD) and cataract, two leading causes of blindness and visual impairment globally (2-4). Cigarette smoking is also a known important risk factor for cardiovascular, respiratory, and malignant diseases (5).

While many people are more aware of the association between smoking and diseases such as lung cancer, heart disease and stroke, few are aware of its relation to blindness (6,7). At a British district general hospital, only 9.5 per cent of patients older than 18 years could identify smoking as a definite or probable cause of blindness, while the awareness levels for such a link with lung cancer, heart disease and stroke were comparatively higher at 92.2%, 87.6% and 70.6%, respectively[8]. Another survey conducted across 14 countries showed that among people who were aware of AMD, only 32 per cent could identify smoking as a risk factor for the disease (9). Although the level of awareness of the link between blindness and smoking is low, many people fear blindness more than other smoking-related conditions.

A recent study of teenagers in the UK reported that British teenagers were significantly more fearful of blindness than of lung cancer, heart disease and deafness. More teenagers commented that they would stop smoking on developing early signs of blindness compared with signs of lung cancer or heart disease (10). Furthermore, only 5% identified smoking as a cause of blindness but that fear of blindness was a strong motivating factor to quit smoking (10).

In another study involving Hong Kong Chinese adults, blindness was the second-most feared disabling health problem after paralysis following a stroke (11).

Tobacco smoke is composed of as many as 4000 active compounds most of them toxic on either acute on long term exposure (12). Many of them are also toxic to ocular tissues affecting the eye mainly through ischaemic or oxidative mechanism (13-15).

The dangerous effects of smoking are transmitted through the placenta and offspring of smoking mothers are prone to develop tobacco-induced amblyopia (16-18). Also, a statistically significant association between parental smoking and refractive error in children has been found. Children of smoking parents (one or both) had lower myopia prevalence and more hyperopia mean refraction than those of non-smokers (19,20).

The purpose of this work was to determine the awareness and perception of university undergraduates to blindness related to smoking as compared to other known smoking related conditions since as young persons who are prone to experimentation, they constitute an at-risk group.

METHOD

This was a cross sectional study using closed-ended structured questionnaire. The study population were undergraduate students from the Ugbowo campus of the University of Benin, drawn from across ten Faculties, excluding the medical sciences. The Faculties covered were Arts, Management Science, Social Sciences, Life Sciences, Physical Sciences, Law, Pharmacy, Engineering, Agricultural Sciences and Education. The students were selected by convenient sampling, because students from the various departments in the different Faculties usually gather or come together at the various locations where the questionnaires for this study were distributed. So at any gathering, there was usually a mixed collection of students from different departments present. The students were between the ages of 16 and 30 years, (mean age 22.2± 2.1 years). This meant most of the respondents were 22 years of age.

Three thousand five hundred questionnaires were distributed between January and June, 2013. The questionnaires were distributed around 1pm to 2.30pm week days, as this was the period of break from

lectures. At this time students are between lectures and they usually are found around hall ways, reading rooms, snack kiosks and the general students' lounges. The students were usually approached in these places. The purpose of the study was explained in details to them and their consent and help in filling the questionnaires were solicited. Participants gave consent before they were given the questionnaires to fill out. Participants were asked in the questionnaires about their awareness of a link between smoking and the four smoking-attributable conditions, lung cancer, heart disease, stroke and blindness. A distractor condition, deafness, for which no causal relationship or link to smoking is established, was added. This distractor condition was included for comparison and to reduce the risk of over reporting for the blindness related question due to participants guessing the focus of the study. This was also the reason why students of Optometry and medical students were exempted from the study. To assess the fear of developing each of the five conditions, participants were asked to rank them from most feared to least feared. Responses were scored from 5 (most feared) to 1 (least feared). Also the likelihood of smokers quitting on developing early signs of each condition was investigated. Ethical approval for the study was obtained from the University Research Ethics Committee.

Inclusion criterion

Participants must be undergraduate students of the University of Benin whether smokers, ex-smokers or non-smokers.

Exclusion criteria

Students in Optometry and College of Medicine were excluded from this study since their participation might result to a bias in the study.

Data Analysis

Data was analyzed using SPSS V16.0. Wincoxin signed rank and Mann-Whitney U tests were used to compare fear rankings for paired and independent sample data, respectively. Level of significance was set at $p<0.05$.

RESULT

Response and demographic profile

Of the 3500 questionnaires distributed, 3000 (85.7%) were returned properly and completely filled. Male students were 61.6% (n=1848) and female students were 38.4% (n=1152). Half of the study population (52.2%), were between 21 to 25 years. Age distribution of the respondents is shown in Table 1. Among the 1152 female participants, 12 (1%) were smokers or ex-smokers and 1140 (99%) were non-smokers. The 1848 male participants included 1113 (60.2%) smokers or ex-smokers and 735 (39.8%) were non-smokers.

Awareness of the link between smoking and blindness

The number of students who believed smoking definitely or probably caused lung cancer, stroke and heart disease was 2760 (92.0%), 2253 (75.1%) and 2577 (85.9%), respectively. About half of the respondents 1488 (49.6%), believed smoking caused blindness compared to 423 (14.1%) for deafness. This is shown in Table 2. The difference between those who believed blindness could be caused by smoking and those who believed blindness could be caused by each of the other smoking related conditions was significant $p<0.001$.

Stimulus to quit on developing early signs of disease

The difference (1.6%) in number of participants stating that they would definitely or probably quit smoking on developing early signs of blindness (85.0%) compared with early signs of lung cancer (83.4%) was not significant, $p= 0.983$. That for early signs of blindness compared with early signs of stroke (49.9%) or heart disease (95.3%) was 35.1% and 10.3% respectively. These differences were significant ($p=0.04$). This is represented in Table 3.

Fear of blindness and other conditions

Table 4 shows the smoking attributable conditions feared the most by respondents. The mean fear ranking score was 4 (4.0) for

blindness, 3 (3.3) for lung cancer, 3 (3.1) for heart disease, 2 (2.2) for stroke, and 1 (1.1) for deafness. The difference in ranking between each of the four other conditions and the ranking for blindness was significant p=0.001. Figure 1 shows the distribution of participants' response to questions asked

DISCUSSION

Tobacco smoking is directly linked to many adverse health effects, such as high blood pressure, heart disease, cancer and also eye diseases (21,22). Public awareness about the risk of eye diseases associated with smoking is very low among large parts of the population in many countries worldwide (23).

This study examined the awareness of the link between smoking and blindness. The strength of this study included a large sample size and a good response rate. We found that few subjects, both smokers and non-smokers, were aware that smoking could cause blindness. This was in contrast with high level of awareness of smoking as a cause of lung cancer and cardiovascular disease. The perceived risk of blindness from smoking, however, was more than that for the distractor condition, deafness. Although subjects were slightly less fearful of deafness from smoking than becoming blind or developing lung cancer or cardiovascular diseases, there was a significant difference in the proportion of smokers who stated they would quit smoking on developing early signs of eye disease.

The findings suggest that increase in the awareness of the link between smoking and blindness may be an effective additional approach to encouraging smoking cessation. The low level of awareness of the link between smoking and blindness, even among smokers, in the study population, may reflect both a lack of general public and patient information on the matter and further lack of effective advice about smoking in health centers.

The finding that fear or awareness of early signs of eye disease might be a stimulus to cessation of smoking, suggests that health-promotional campaigns and health warnings providing information about the risks of smoking-related eye disease and blindness to smokers may be well effective in eye clinics, as well as in the general public.

Moreover smoking may increase the risk for developing some eye diseases in particular arteriosclerosis, and is a major factor contributing to the early development of age-related macular degeneration (AMD) which may lead to blindness and some forms of cataracts (24). Among the various risk factors of cataracts, cigarette smoking is a prominent one. It has been clinically verified that cigarette smoking and the smoking of other substances lead to a substantial increase in the oxidative stress in the lens which further accelerates the development of cataract (25).

Stopping to smoke was associated with a marked, non-linear decrease of the risk of progression to AMD and reduces the risk of developing cataracts. Studies (26,27) suggested a stronger association between smoking and nuclear cataract than between smoking and cortical or posterior subcapsular cataract. Compared with never smokers, smokers of 20 or more cigarettes per day are at least twice as likely to develop nuclear cataract[28]. Smoking reduces the supply of antioxidants in the eyes, which may lead to cataracts. Increased cadmium levels in cataract lenses of smokers may also affect lens enzymes such as superoxide dismutase and glutathione peroxides, which can lead to oxidative damage.

A number of authors have attempted to correlate cigarette smoking with the development and deterioration of diabetic retinopathy (21,24). Smoking may accelerate the development of, or worsen diabetic retinopathy, because smoking also damages blood vessels (17,22). This issue is of relevance both for individual patients and for public health, as the proportion of smokers among patients with diabetes is no smaller than that in the general population.

It has been demonstrated that there are higher blood flow velocities in the ophthalmic arteries and central retinal veins of long-term smokers than of nonsmokers (22,23).

Tobacco smoke, even passive smoke inhaled by children, can alter the tear film of eyes, exacerbating dry eye syndrome and allergic eye conditions (18,24,25). Stopping to smoke can reduce the risk of developing cataracts. Both cataract development and age-related macular degeneration, the leading causes of severe visual impairment and blindness, are directly accelerated by smoking (26).

Oxidative stress has long been hypothesized to play a major role in the development of AMD due to the high oxidative stress environment of the fundus. Importantly, these changes indicate that oxidative damage is an important factor in the mechanism of disease development (25,26). Smokers have a higher risk of the more advanced presbyopia and the risk is elevated in heavy smokers. The age of onset of presbyopia as a result of smoking is earlier than that of non-smokers (22,23,27).

The low level of awareness of blindness as a smoking-related condition—despite blindness being one of the most feared disabilities—presents a unique opportunity for optometrists to play a key role in smoking cessation. The 2005 World No Tobacco Day, organised by the World Health Organization, was themed 'The role of health professionals on tobacco control', in recognition of the prominent role that health-care workers, such as optometrists, can play in tobacco control.
Studies (28,29) have shown that even brief counselling by health-care professionals on the dangers of smoking and the benefits of quitting is one of the most cost effective methods of reducing smoking as their daily contact with patients enables them to reach a significant percentage of the population. This endows them with the opportunity to modify their patients' behavior by providing smoking cessation advice, as well as answers to questions related to the consequences of tobacco use (29).

Optometrists are one such group of primary health-care professionals who can play a key role in tobacco control. They can also advice children and adolescents on the dangers of tobacco. This is because they form a group of 'first-contact' eye-care givers who, besides providing quit-smoking advice, can highlight the link between smoking and blinding conditions to motivate smokers to give up the habit.

Conflict of Interest
The authors have no conflict of interest to declare.

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Table 1: Age Distribution of Respondents

Age group	Male n=1848	(%)	Female n=1152	(%)	Total n=3000	(%)
16-20	252	(13.6)	159	(13.8)	411	(13.7)
21-25	1014	(54.9)	552	(48.0)	1566	(52.2)
26-30	582	(31.5)	441	(38.2)	1023	(34.1)

Table 2 Respondents' awareness of the relationship between smoking and Attributable conditions

Conditions	Yes		Probably		No	
	no	(%)	no	(%)	no	(%)
Blindness	141	(4.7)	1347	(44.9)	1512	(50.4)
Lung Cancer	2460	(82.0)	300	(10.0)	240	(8.0)
Stroke	306	(10.2)	1947	(64.9)	747	(24.9)
Heart Disease	2196	(73.2)	381	(12.7)	423	(14.1)
Deafness	102	(3.4)	321	(10.7)	2577	(85.9)

Table 3: Respondents who would quit Smoking on Developing Early Signs of the Attributable Conditions

Conditions	Yes		Probably		No	
	No	(%)	No	(%)	No	(%)
Blindness	1686	(56.2)	864	(28.8)	450	(15.0)
Lung Cancer	1523	(50.8)	978	(32.6)	499	(16.6)
Stroke	973	(32.4)	524	(17.5)	503	(50.1)
Heart Disease	1897	(63.2)	962	(32.1)	141	(4.7)
Effect on eyes	72	(2.4)	561	(18.7)	2367	(78.9)

Table 4: Distribution of diseases feared the most by Respondents

Diseases	Male n=1848	(%)	Female n=1152	(%)	Total n=3000	(%)
Blindness	1053	(57.0)	528	(45.8)	1581	(52.7)
Lung cancer	213	(11.5)	195	(16.9)	408	(13.6)
Stroke	201	(10.9)	102	(8.9)	303	(10.1)
Heart disease	264	(14.3)	186	(16.1)	450	(15.0)
Deafness	117	(6.3)	141	(12.2)	258	(8.6)

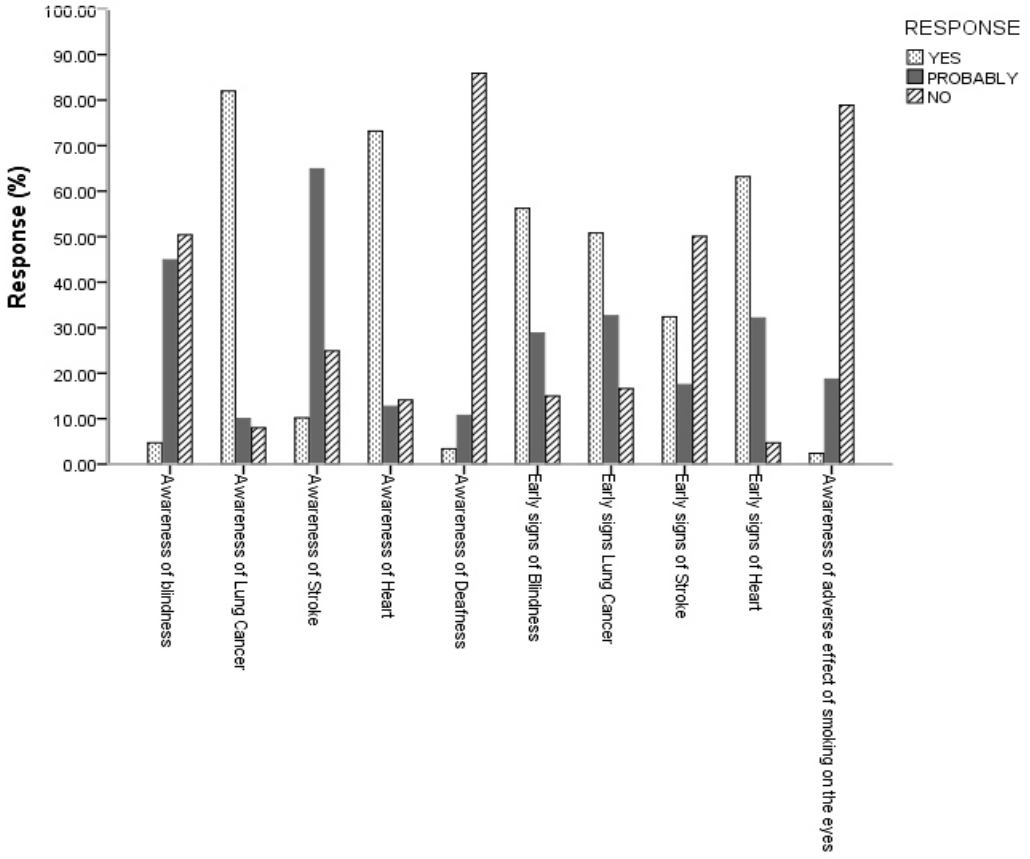

Figure 1 Distribution of participants' response to questions asked