Objective: The aim of the study was to assess the knowledge, attitude and practice of cigarette smoking behavior (CSB) in a sample of Indian matriculation students.

Methodology: All (N=325) Indian matriculation students, at high schools, in Northern Kwa-Zulu Natal, South Africa, were included in the study. A questionnaire was administered to assess knowledge, attitudes and practice of CSB.

Results and conclusion: The study showed a prevalence of 16.9%. Most smokers (98.2%) had commenced the practice after the age of 10 years. The most common reason given for CSB was experimentation (83.6%). Main influence was family members followed by teachers and advertisements. The association between smoking and lung cancer was well-known by smokers (90.7%). There was very little awareness of anti-smoking programmes or organizations. Alarmingly, there was little formal health education on the dangers of smoking in schools. The implications of these results are discussed and recommendations on decreasing CSB are made.

Key Words: Smoking Behavior, attitudes, knowledge, students, experimentation and South Africa.

Correspondence to: Dr. Mohammed H. Cassimjee, Head of Department of Family Medicine, Faculty of Medicine, University of Natal, Durban, South Africa.
INTRODUCTION
Cigarette smoking (CS) is a major public health concern because of its impact on the health of both smokers and non-smokers.\textsuperscript{1,2} Internationally, there is an increased public awareness about the health risks of CS which is reflected in the declining rates of CSB in the developed countries, while in developing countries, the rates are increasing. In South Africa, the prevalence of smoking has dropped in the white community while it has increased among Coloreds, Indians and Blacks.\textsuperscript{3}

The association between smoking and coronary heart disease, respiratory diseases and carcinoma of the lung, is well known. The hazards of really prolonged cigarette smoking are greater than what is supposed. The “real problem” is the long delay between cause and full effect. Children who smoke, therefore, may not see the immediate benefits of stopping smoking and only feel the detrimental impact of CS later in life.\textsuperscript{4-6}

The overall prevalence rate of CSB ranges from 2.37% and is strongly influenced by culture, age and gender.\textsuperscript{7} In a cross-sectional study of school children in Singapore, smoking prevalence rates were found to be significantly lower than that of school children in Australia, England and Wales, Scotland, South Africa and Malaysia.\textsuperscript{8} The average age at which smoking commenced was 14 years. Hussein Al Mumen in Kuwait reported a decline in smoking prevalence in adults but an increase of smoking prevalence in the under 20 age group from 13% in 1979 to 34% in 1988.\textsuperscript{7} The prevalence rate among females in Kuwait had also risen from 2.2% in the 70’s to 12% in the late 1980’s. In South Africa, Black school children showed a prevalence rate of 23.7% for boys and only 0.8% for girls, the median age of onset being 14 years of age.\textsuperscript{9} Among white high school children in Cape Town there was a prevalence of 21%, the rate for girls being slightly lower than that for boys. In South Africa, the smoking prevalence among Indians in 1984 was 29%, overall, with a prevalence rate of 3.2% in females.\textsuperscript{8,10,11} In the 16-24 years age group, the smoking prevalence rate was 21.7%. No figures for Indian school children are obtainable. A survey done in Singapore suggests that as many as 90% of children are aware of the harmful effects of smoking.\textsuperscript{7} They were aware that CSB was associated with lung cancer (49%), heart disease (6%), and that it was bad for the health of smokers (25%) and passive smokers. The survey also found that respondents agreed that smoking was addictive and that while half of the smokers would like to stop smoking, most had failed to stop. Among the reasons for smoking, one-third smoked for fun and/or curiosity, 22% due to addiction, 13% due to boredom, 10% to emulate others, 7% to look stylish and 9% had no specific reason. The study also found that 57% of the youngsters bought their cigarettes from shops and that parents who smoked were more likely to have children who smoked as well. In this study, it was also found that 88% of smokers had best friends that smoked.

This study was undertaken to contribute to relieving the dearth of data on CSB among Indian school children in South Africa.

MATERIAL AND METHODS
All (N=325) Indian matriculation students, at high schools in Newcastle, Dannhauser, Glencoe and Dundee, in Northern Kwa-Zulu Natal, South Africa and for whom parental consent was obtained were included in the study. These schools previous to 1994 were reserved only for Indian children under apartheid rule. The reasons for choosing these schools were twofold: firstly, it was convenient for the researchers and secondly, it provided data on peri-urban or rural areas. A questionnaire designed by the authors in con-
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consultation with a statistician, was administered to the subjects. The questionnaire contained items that elicited sociodemographic data, information on the development of CSB, and it also assessed knowledge and attitudes towards cigarette smoking.

RESULTS

Of the 326 children who participated in the study, 144 (46.9%) were males and 163 (53.1%) females, 19 (5.83%) did not specify their gender. The mean age was 17.2 years with a range of 16-20 years. The prevalence rate of CS for the study group was 16.9%. Of the males, 52 (36.1%) were smokers and among the females, 3 (1.8%) smoked. There was a significant difference between males and females (p=0.001). Of those who smoked, 52 (94.5%) were males and 3 (5.5%) were females.

With regard to religion, there was no significant difference in CSB between the various religious groups (Table 1). The results showed that smokers generally received more pocket money than the non-smokers (Table 2). Most of the smokers, 54 (98.2%), had commenced smoking at the age of 11 and over (Table 3). Among the non-smokers, 164 (62.8%) had had at some stage some experience with cigarettes, while 58 (22.1%) were ex-smokers.

Table 1: Smoking in the various religious groups

| Status            | Christian N (%) | Hindu N (%) | Muslim N (%) | None N (%) |
|-------------------|----------------|-------------|--------------|------------|
| Smokers           | 13 (20.6)      | 28 (16.4)   | 11 (16.9)    | 2 (40)     |
| Non-smokers       | 50 (79.4)      | 143 (83.6)  | 54 (83.1)    | 3 (60)     |
| Total             | 63 (100)       | 171 (100)   | 65 (100)     | 5 (100)    |

Among the current smokers, 2 (3.6%) had smoked previously and had returned to the habit. There were many reasons associated with CSB. Twenty-three (42.6%) had reasons for smoking while the others did not. The major reasons were: the result of experimentation 46 (83.6%); calmed the nerves 41 (74.5%); friends were also smokers 52 (94.5%) enjoyed smoking 42 (77.8%). Other reasons for developing CSB are listed in Table 4. Although only a small number, 9 (16.7%) said that they were influenced by family members, an analysis of family members who were smokers was also done for both the smokers and the non-smokers in the study group (Table 5).

Table 2: Pocket money received by smokers and non-smokers

| Amount of pocket money per week | Smokers N (%) | Non-smokers N (%) |
|---------------------------------|---------------|-------------------|
| R0-5                            | 8 (15.1)      | 78 (32.6)         |
| R6-10                           | 16 (30.2)     | 66 (27.6)         |
| R11-20                          | 13 (24.5)     | 48 (20.1)         |
| More than R20                   | 16 (30.2)     | 47 (19.6)         |
| Total                           | 53 (100)      | 239 (100)         |

Table 3: Age at which smoking commenced

| Age                      | N (%) |
|--------------------------|-------|
| Under 5 years            | 0 (0) |
| 6-10 years               | 1 (1.8) |
| 11-15 years              | 25 (45.5) |
| 16 years and above       | 29 (52.7) |
| Total                    | 55 (100) |

Table 4: Reasons for developing CSB

| Reason                          | Yes N (%) | No N (%) |
|---------------------------------|-----------|----------|
| Have a reason for smoking       | 23 (42.6) | 31 (57.4) |
| Experimented before smoking     | 46 (83.6) | 9 (16.4)  |
| Friends are smokers             | 52 (94.5) | 3 (5.5)   |
| Influenced by friends           | 18 (32.7) | 37 (67.3) |
| Attracts opposite sex           | 7 (12.7)  | 48 (87.3) |
| “Calms the nerves”              | 41 (74.5) | 14 (25.5) |
| Enjoy smoking                   | 42 (77.8) | 12 (22.2) |
| Influenced by advertisements    | 10 (18.2) | 45 (81.8) |
| Influenced by teachers          | 11 (20.0) | 44 (80.0) |
| Influenced by family members    | 9 (16.7)  | 45 (83.3) |

Of the smokers, 49 (89.1%) said that smoking was harmful to their own health and 41
(74.5%) said that it was harmful to others, while 38 (69.1%) believed that smoking was an addiction (Table 6). None of the smokers said that smoking was harmless. Among the smokers, 49 (90.7%) knew of the association between lung cancer and smoking, but the association between smoking and heart disease, smoking and other cancers was generally less well known (Table 7).

Table 5: Family members who were smokers

| Family Member | Smokers | Non-smokers |
|---------------|---------|-------------|
| Father        | 75      | 70.9        |
| Mother        | 19      | 15.3        |
| Brother(s)    | 41.1    | 27.1        |
| Sister(s)     | 6.3     | 4.9         |

Table 6: Effects of cigarette smoking

| Effects of smoking          | Yes N (%) | No N (%) | Don’t know N (%) |
|-----------------------------|-----------|----------|-----------------|
| Harmful to own health       | 49 (89.1) | 2 (3.6)  | 4 (7.3)         |
| Harmful to health of others | 41 (9.1)  | 5 (16.4) | 9 (16.4)        |
| Absolutely harmless         | 0 (0)     | 49 (90.7)| 5 (9.3)         |
| Smoking is an addiction     | 38 (69.1) | 14 (25.5)| 3 (5.3)         |

Table 7: Association between smoking and diseases

| Smoking associated diseases | Yes N (%) | No N (%) | Don’t know N (%) |
|-----------------------------|-----------|----------|-----------------|
| Lung cancer                 | 49 (90.7) | 2 (3.7)  | 3 (5.6)         |
| Chest disease               | 27 (57.5) | 5 (10.6) | 15 (31.9)       |
| Other cancers               | 20 (42.5) | 5 (10.6) | 22 (46.8)       |
| Heart disease               | 23 (49.0) | 3 (6.4)  | 21 (44.7)       |

Forty-one smokers (77.4%) had tried to stop smoking, while 42 (77.8%) indicated that they would stop smoking. Nineteen (34.5%) said they would definitely continue to smoke, whereas 33 (58.2%) were uncertain about smoking in the future.

Seven smokers (12.7%) and 24 (9.3%) non-smokers were aware of organizations involved in anti-smoking programmes. However, only 4 (1.2%) smokers could actually name an organization that promoted anti-smoking programs, e.g., South African National Council on Alcohol and Drug Dependence (SANCA). With regard to formal talks or lectures given at school, 11 (20%) reported that they were addressed at school about the dangers of smoking.

DISCUSSION

There was a significant difference in the prevalence rate between males and females (52 36.1% and 3; 1.8% respectively). While there is no data available to compare prevalence rates among Indian school girls in South Africa, one study on adult Indian females, in South Africa, showed a prevalence rate of 3.2%. This is, however, in keeping with international trends. There was no significant difference in CS among the various religious groups. According to this study, religion seemed to have no influence on CSB. Given that smoking is forbidden by various religious groups, this may account for the lack of significant difference in the CSB of the subjects.

Availability of pocket money seemed to play a role in CS. Although the difference was not statistically significant, overall, smokers received more pocket money than non-smokers. This may suggest that the availability of money encouraged them to continue the habit.

The young age of onset is alarming. The interest that pre-pubertal children develop exerts a powerful influence on present as well as future behavior. There is thus a need to develop wholesome interests and avoid behavior associated with risk, such as CS. This parameter should be of immense importance in formulating health education strategies. Anti-smoking campaigns can thus focus on the younger age group. The ill effects of smoking must be emphasized during health education lessons in school.

The prevalence of smoking in the study group was 16.9% and is similar to that in White high school children in Cape Town
(21%) and a prevalence rate of 21.7% found in the South African Indians aged 16-24 years.\textsuperscript{8,10,11} The 17-18 years group prevalence of CBS is higher in Whites (34.5%) than in this study (21.7%). Black school children in Cape Town had an even higher prevalence rate (45%) in the 16 years and older age group. A significant finding was that 46 (83.6%) smokers had experimented with cigarettes first before taking up CSB. This finding corroborates studies in Singapore and also in South Africa where Strebel et al, found that in Black school children in Cape Town regular smoking followed experimentation with cigarettes.\textsuperscript{8,9} The experimental phase seems to be important in establishing CS and for successful prevention programmes, education must focus on this stage in the evolution of CSB. Experimentation probably begins prior to the 10\textsuperscript{th} birthday.

The role of peer groups in CSB is significant. Of the smokers, 18 (32.7%) were influenced by their friends, and 52 (94.5%) had friends who were also smokers. Similar trends were observed in Singapore (13.7% were influenced by friends)\textsuperscript{8} and Hong Kong (88% had a best friend who was a smoker).\textsuperscript{7} Other studies have shown that peer pressure is the single most powerful determinant of smoking in children.\textsuperscript{7,8,12} The findings in this study also emphasize the role of peers in the development of CSB.

Of the smokers, 11 (20%) were influenced by teachers. In Singapore, 1.5% of smokers emulated their teachers.\textsuperscript{7} In a single school at Thaba Nchu, South Africa, it was found that 81.6% of male teachers were smokers. The role of teachers in CSB is very important, because of their role-model status. Children tend to imitate their teachers who serve as influential models.\textsuperscript{13} Thus teachers’ attitudes towards CS and their CSB has an impact on school children. It is important that teachers project and promote a healthy lifestyle.

With regard to CS by family members, 9 (16.7%) were influenced by their family. Although statistically not significant, it is noteworthy that there were more smokers in the families of the smoking group as opposed to those students who did not smoke. Parents invariably serve as models for children to imitate. Imitation is assumed to play a key role in the development of behavior which is viewed as appropriate by the family. Family members are, therefore, very important role models.

Advertising of cigarettes is a powerful weapon in promoting smoking. Advertisements often convey messages which associate smoking with success, sophistication, sexuality, pleasure and relaxation.\textsuperscript{14} In this study 18.2% of smokers were influenced by advertisements. Research in the USA has found that adolescents with a high exposure to cigarette advertising were significantly more likely to be smokers.\textsuperscript{15} The impact of advertising on CSB is hardly surprising, especially on the impressionable minds of children. This is one area in which legislation can certainly assist in curbing smoking. In some countries advertisements of tobacco products are completely banned, while in South Africa, only a partial ban applies.\textsuperscript{16} The new legislation in South Africa requires that all advertisements of tobacco products carry a health warning.\textsuperscript{17} Advertisements of tobacco products on television are banned in South Africa but advertising on radio continues, a medium that reaches more people than television does. Indirect advertisement occurs on television in South Africa by way of sports sponsorship. Tobacco advertisements are permitted in cinemas where, on average, over 50% of the audience is under the age of 17 years.\textsuperscript{18} If legislators are serious about preventing the exposure of the young to tobacco advertisements, a total ban should be imposed on cinema advertisements.
Forty-two smokers (77.8%) enjoyed smoking. The others did not enjoy smoking, but presumably continued because of their addiction to nicotine. Smoking also had a calming effect on 41 (74.5%) smokers, due to the fact that nicotine reduces aggression and decreases irritability.

It was interesting that all smokers agreed that smoking was not completely harmless and yet they continued to smoke. Forty-one (74.5%) smokers were aware that passive smoking was harmful. This is a phenomenon that almost everyone is subjected to daily, and raises an important question: Is there such a being as a non-smoker?

The disease risk due to inhalation of tobacco smoke is doubled in children of parents who smoke. The Surgeon General of the USA in 1986, recommended that protecting the individual from environmental tobacco smoke is a responsibility shared by all, including parents. Under the new legislation, local authorities can restrict smoking in public places and enforce it by law. This has very wide implications, as the legislation is not directed at the smoker, but at protecting the non-smoker from environmental tobacco smoke. Environmental tobacco smoke (ETS) has been classified as a Class A carcinogen, that is, a known human carcinogen. There are only nine other substances in this category. This study showed that the association of CS with other cancers and heart disease was less well-known, and many either did not know this or were uncertain about it.

It is alarming that though the effects of smoking on health are generally known, smoking in adolescence continues. The same holds true in the USA, where publicity made a considerable impact on adults who are addicted to tobacco, while it had less effect on non-addicted youth. The conclusion is that, knowledge concerning health risks of smoking and exposure to negative attitudes towards smoking, are not sufficient reasons to prevent smoking among adolescents. This fact is of concern, especially in planning and presenting anti-smoking campaigns to the youth. Research should be directed at prevention programs which take into account the developmental processes, and the personal and social expectations of adolescents.

In a study by Battia et al, in which attitudes and beliefs about the health consequences and social value of smoking were assessed, it was concluded that for smoking prevention programmes to be successful with the youth, they must be offered more than just education about the health hazards of smoking.

There were mixed attitudes towards smoking. In the main, there was an air of uncertainty about continuing CS in the future, since 42 subjects (77%) had expressed the desire to stop smoking and forty-one respondents (77.4%) had tried to stop but failed. This ambivalence towards smoking among the youth, is a troubling problem. In adults, there is always a desire to stop. Smoking in adults is socially acceptable, while it is prohibited in childhood. Adolescence is a transitional period in which childhood prohibitions are shed, and adult behavior becomes incorporated. Smoking can perhaps be viewed as a part of this progression into adulthood.

While smoking remains socially acceptable, children will see no harm in CSB. Only when smoking becomes a socially unacceptable behavior in adults, will young smokers be motivated to change their habits.

There was hardly any awareness of organizations or groups that conducted anti-smoking programmes, (12.7% of smokers and 9.3% of non-smokers). The only organization that was known was SANCA. Very few formal lectures or talks were given in schools on the dangers of smoking.
RECOMMENDATIONS
The study was conducted in Northern Kwa-Zulu Natal, South Africa, and results reflect findings in a group of Indian high school students. It is suggested that (1) education about health be made mandatory in schools, emphasizing hazardous activities such as smoking; (2) there be a prohibition of smoking in schools among academic and non-academic staff; (3) anti-smoking campaigns be directed at pupils, teachers and other staff members should be held regularly by interest groups; (4) local authorities should use their legislative powers to prohibit smoking in most public places, especially those frequented by children, such as discotheques and sports events and ban direct and indirect tobacco advertising at such places.

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