# PREDICTORS OF SMOKING PRACTICE AMONG HIGH SCHOOL LEARNERS

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## Abstract

**Introduction:** Smoking presents a challenge to the future health status of learners who are smokers. There are over one billion smokers in the world today. Smoking is evident among the youth of South Africa with 19.6% of them being involved in this habit.

**Objectives:** The objective of this study was to investigate the prevalence of smoking in grade twelve learners. It was further investigated whether socio-demographic factors may influence the prediction of the smoking practice among these learners.

**Methods:** This paper is reporting on a selective concept of a larger cross-sectional descriptive survey.

**Participants:** All learners who gave informed consent and who were enrolled during 2001 as grade twelve learners at three selected schools (n=452), were recruited to participate in the survey.

**Setting:** The study was done in the multi-cultured community of Tshwane South Education District located in Gauteng Province. The district was divided into three strata. One school was selected randomly from each stratum.

**Intervention:** A self-administered questionnaire.

**Results:** There were 401 (89%) returned questionnaires. Overall 104 (26%) of students were current smokers. Smoking practice was a significantly associated with race, gender, smoking habits of parents, siblings and friends and fathers' employment status.

**Conclusion:** Smoking amongst grade 12 scholars is on the increase and specific predictors may play a role to influence the uptake of smoking among learners.

**Keywords:** Smoking practice, high school learners

## Introduction

Smoking presents a challenge to the future health status of learners who are smokers. There are over one billion smokers in the world today (World Health Organisation, 1995). Smoking practice among young people has become manifested in South Africa, with 19.6% of them involved in the practice (Guthrie, Shung-King, Steyn & Mathambo, 2001). The smoking practice of learners is influenced by different factors. The value in this assumption lies in the recognition that behaviour and practice are determined by predictors, which can include factors such as: social, individual, family, institutional etc. Choi, Harris, Okuyeni & Ahluwalia (2003) reported that smoking rates among high school learners in the United States of America (USA) is increasing, yet little is known about the factors that influence this group to engage in smoking. Various authors reported on gender being one of the factors affecting smoking habits of learners in England and Japan. It is noted that more and more girls are starting to become regular smokers (Foulds & Godfrey, 1995). In Japan, the percentage of regular smokers increased to 20.3% for boys and 2.2% for girls, with the proportion of boys smoking ten or more cigarettes per day increasing as age increased (Osaki & Minowa, 1996). Taylor, Jiabhai, Naidoo, Kleinschmidt & Dlamini (2003) did a cross-sectional study among rural high school learners in KwaZulu-Natal. Twenty-eight high schools and 1318 grade 10 pupils, mostly of the black race, participated in the study. They found that the odds of smoking increased significantly (p=0.0005) with use of other substances and that 13.1% of males and 2.3% of girls smoke more than one cigarette daily. There is also a difference between race groups and smoking habits. Coloured people (37%) had the highest smoking prevalence, followed by Whites (28%) in South Africa (Goldstein (1996).

Marks, Steyn and Ratheb (2001) supported the high incidence of smoking among the coloured (40%) and white (23.2%) population and stated that the prevalence is still lower among the Black Africans. Dislike of school and rebelliousness were also reported as contributing factors that may influence smoking practice among school children (Choi et al., 2003). Zhu, Liu, Shelton, Liu & Giovino, 1996 and Padget, Selwyn & Kelder, 1998 reported that social interaction also influence smoking habits. Interaction with family members, peers, siblings and teachers that smoke also contribute to an increase in uptake of smoking among learners. A father who smoke was highly likely to contribute towards initiation of smoking among male secondary school children (Shamsuddin & Harris, 2000; Zhu et al., 1996, Padget et al. 1998 and Shamsuddin & Harris 2000). Brook, Morojele, Brook, Zhang & Whiteman (2006) and Zhang, Wang, Zhao & Vartiainen (2000), supported the above-mentioned authors and stated that having peers, teachers, or mothers who smoked had a tendency of increasing the odds of smoking in young people. Elder et al (1996) stated that having a best friend or sibling who smoked or had ready access to cigarettes in a home were factors associated with the likelihood of experimenting in smoking. Saati, Inan, Bozdemir, Akpinar & Ergun (2004) reported that the main determinants of regular smoking behaviour for university students in Turkey were likely to be males, low academic performance, having smoking friends, high level of income, and a mother with high education level. It is well acknowledged that other factors such as alcohol, cannabis and other drugs are associated with the increase of smoking habits (Grucza & Bierut, 2006; Taylore et.al. 2003). The general results reflected that smoking is determined by complex interplay of different factors such as

age, gender, race, education and other drug usage (Saati et al., 2004; Bello, 2005; & Wetter et al., 2004). Smoking is therefore a risky behaviour and as such, efforts to understand and deal with this practice should take cognisance of its predicting multiple factors. This article aims to be informative to policy makers, educators and health promoters by describing factors that may predict smoking among learners thus assisting in the development of appropriate and relevant health promotion programmes in the school setting.

## Method

### Research setting

The research was conducted in the Tshwane South Education District, a multi-cultured (i.e. Africans, White, Coloured and Indians) community of Tshwane Metropolitan in Gauteng Province of South Africa. The Tshwane South Education District is one of the twelve education districts in Gauteng province and the third in the Greater Tshwane Metropolitan. There are forty public high schools in this district.

### Research design

This paper is a report of a selected component of research within a larger study. It employs a cross-sectional analytical survey to describe factors that predict smoking among the grade twelve learners of randomly selected public high schools of the Tshwane South Education District.

### Sample and procedure

The study population involved grade twelve learners from the ages sixteen to the age of twenty five who were enrolled in the grade twelve class of the 2001 academic year. A multi-stage sampling technique was used. Firstly, Tshwane South was divided into three strata (i.e. eastern suburbs i.e. predominated

by Whites, Laudium for Indians and Mamelodi for Black Africans). Secondly, one school was selected randomly from each stratum to get three high schools. Finally, a convenient sampling technique was used and a total of (n=452) grade twelve learners were recruited into the study. Assuming a smoking prevalence of 25% (from national data), a sample of 300 would be sufficient to estimate the smoking prevalence to within approximately 5%, using 95% confidence limits. Grade twelve learners who were present at three schools on the days of data collection and willing to participate were included.

### Instrument

A self-administered questionnaire comprising of mostly closed ended questions was used to gather the information. Open-ended questions were included to get more clarity on the responses. The questionnaire was developed in English and consisted of 25 items of the main study. English was used because it was the medium of instruction in all the schools. This particular area of study obtained the following information: race, age, gender, smoking status of the student, number of cigarettes smoked per day, smoking status of parents, smoking status of siblings, participation in sport, having a friend who smokes and whether or not a smoking friend had an influence on smoking habit. The questions were developed based on literature (Smith & Umenai, 2000).

### Data collection

The questionnaire was completed by the grade twelve learners on three consecutive days after school for a period of thirty (30) minutes.

## Validity and reliability of the instrument

Measures taken to enhance the validity and reliability of the study included: approval of a questionnaire by the Post graduate Committee of the University of the Witwatersrand; the content in the questionnaire was phrased in such a way that it displayed neutrality (Lee, 1993); the questionnaire was piloted on grade twelve learners of a high school in Ga-Rankuwa, a township in the North-West Province. All unnecessary and ambiguous questions were removed following results of the pilot study. The researcher oversaw the administering of the questionnaire. Participants were instructed not to write their names, nor school name or any form of identification on the questionnaires. They were also told to place the questionnaire inside an envelope after completion, and drop it in a box that was provided. Each completed questionnaire was given a response number starting form one.
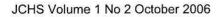
## Ethical Considerations

The researcher obtained individual consent (i.e. from learners who were over 18 years old), parental consent (for learners who were below 18 years old) and institutional consent (from Gauteng Education Department and Tshwane South Education District) as well as ethical and protocol approval from the Ethics and Postgraduate Committees of the University of the Witwatersrand. Participant confidentiality and anonymity were upheld throughout the study.
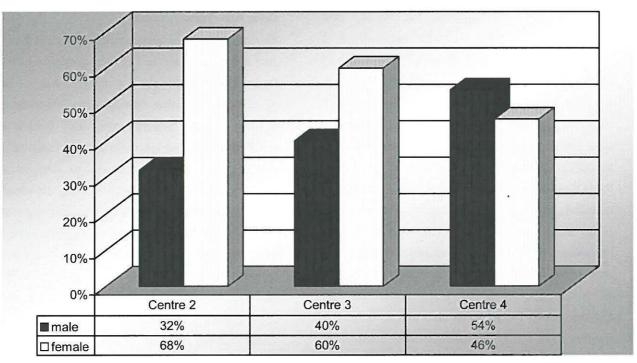
## Data Analysis

The questionnaires were coded and data entered into a computer using Epi Info version 6 (1995). Descriptive statistical analysis was used. Associations between demographic variables and smoking status, between other risk factors and smoking status, between interpersonal factors and smoking and between schools or centres and smoking, were firstly examined using chi-squared tests for associations. Multiple logistic regression models were fitted to find which factors were the most important in determining whether or not the students currently smoked, and whether or not they had ever smoked. Model selection was done using both forward selection and backward elimination. These techniques both resulted in choosing the same factors namely centre or school, race and gender. The data analysis and logistic regression analysis were performed using the STATA statistical package (1999).
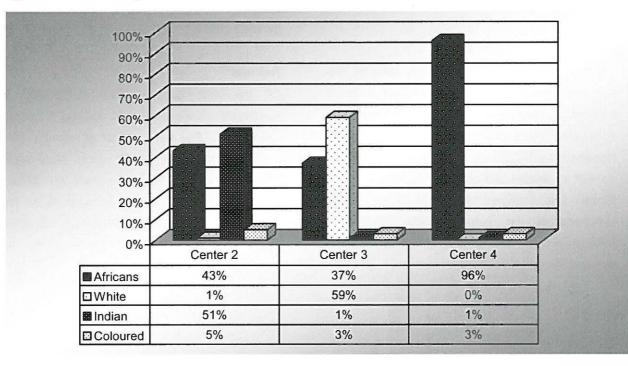
## Results

Of the 452 questionnaires distributed, 401 questionnaires were returned; yielding a response rate of 89%. The mean age for all learners was 18 years (SD=1.2, range 16 – 25 years). More females than males participated in the study 237 (59%) vs 164 (41%) males (Figure1). Although all the racial groups were found within each school, the African group accounted for 56% (225) of the total population (Figure 2).

**Figure 1:    Gender by school**



| | Centre 2 | Centre 3 | Centre 4 |
|---|---|---|---|
| ■ male | 32% | 40% | 54% |
| □ female | 68% | 60% | 46% |

**Figure 2:    Race by school**



| | Center 2 | Center 3 | Center 4 |
|---|---|---|---|
| ■ Africans | 43% | 37% | 96% |
| □ White | 1% | 59% | 0% |
| ▦ Indian | 51% | 1% | 1% |
| ▣ Coloured | 5% | 3% | 3% |

Multiple logistic regression models were fitted to find which factors were the most important in determining whether or not the students currently smoked. The multiple logistic regressions model showed that being:

At a predominately white school
Being a white male
Or being a coloured female

Increase the risk of smoking significantly.

Being an African female has the lowest prediction to take up smoking (Table 1). Nearly one third (26%, 104/401) of all the learners were current smokers. This study showed that the following factors:

Gender
Race
Smoking status of mother
Smoking status of sister
Smoking status of friend

were significantly associated with smoking in learners. (Table 2).

**Table 1:** **Multiple logistic regression models for factors associated with smoking**

| Factor | OR (95% CI) | | Factor | OR (85%) CI | |
|---|---|---|---|---|---|
| Centre 2 | 1.10 | (0.37; 3.26) | White female | 2.92 | (0.90; 9.51) |
| Centre 3 | 3.20 | (1.37; 7.52)* | Indian male | 2.28 | (0.97; 5.38) |
| Centre 4 | 1 | | Indian female | 0.29 | (0.05; 1.70) |
| African male | 1 | | Coloured male | 3.33 | (0.77; 14.49) |
| African female | 0.28 | (0.12; 0.62)** | Coloured female | 18.15 | (1.24; 264.81)* |
| White male | 4 | (1.73; 9.27)* | | | |

*Significantly associated with smoking    ** significantly not associated with smoking

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**Table 2:     Factors associated with smoking**

| Factor | | N | Non Smoker | | Smoker | | P-Value |
|---|---|---|---|---|---|---|---|
| | | | N | (%) | n | (%) | |
| All student | | 401 | 297 | (74%) | 104 | (26%) | |
| Gender | Male | 167 | 109 | (65%) | 58 | (35%) | |
| Total N = 401 | Female | 243 | 188 | (80%) | 46 | (20%) | P=0.001 |
| Race | African | 222 | 191 | (86%) | 31 | (14%) | |
| Total N = 397* | White | 90 | 44 | (49%) | 46 | (51%) | |
| | Indian | 71 | 56 | (79%) | 15 | (21%) | P< 0.001 |
| | Coloured | 14 | 5 | (36%) | 9 | (64%) | |
| Father smoking status | Smoker | 137 | 99 | (72%) | 38 | (28%) | |
| Total N = 352* | Non-Smoker | 176 | 138 | (79%) | 38 | (21%) | P=0.007 |
| | Ex-smoker | 39 | 21 | (54%) | 18 | (46%) | |
| Mother smoking status | Smoker | 46 | 23 | (50%) | 23 | (50%) | |
| Total N = 377* | Non-Smoker | 309 | 243 | (79%) | 66 | (21%) | P<0.001 |
| | Ex-smoker | 22 | 14 | (64%) | 8 | (36%) | |
| Sister smoking status | Smoker | 38 | 22 | (58%) | 16 | (42%) | |
| Total N = 298* | Non-Smoker | 260 | 204 | (79%) | 56 | (21%) | P=0.001 |
| Friend smoking status | Yes | 317 | 217 | (69%) | 100 | (32%) | |
| Total N = 396* | No | 75 | 74 | (99%) | 1 | (1%) | P<0.001 |
| | Don't know | 4 | 2 | (50%) | 2 | (50%) | |
| Father employment status | Full-time | 232 | 166 | (72%) | 66 | (28%) | |
| Total N = 343* | Part-time | 15 | 15 | (100%) | 0 | (0.0%) | |
| | Unemployed | 33 | 28 | (86%) | 5 | (15%) | P=0.012 |
| | Self-employed | 63 | 40 | (63%) | 23 | (37%) | |

*If N not 401 then missing data or not applicable for specific students

## Discussion

It is alarming to see that learners' current smoking is exceeding the national rates (19.6%) reported by Guthrie et al. (2001). The increase in the prevalent smoking rate of 26% exposes learners to an increase risk of suffering from tobacco related diseases such as chronic obstructive airway disease, high blood pressure and heart failure etc. Smoking among young people is a public health disaster because tobacco is reported to be killing three million people every year (WHO Report, 1999). These learners stand a chance of getting addicted. Once they get addicted they will have a continuous urge of smoking to maintain blood nicotine levels and to avoid unpleasant withdrawal signs such as: slowed heart rate, difficulty in concentration, reduced thinking, irritability, anger, anxiety and etc (Engel, 1996). Thus, this puts the learners' health at risk because the number of years of their smoking may shorten their lives (Engel, 1996; Department of Health, 1998). In view of the minimum age (i.e.16 years) of learners in the study

and adding 15 years to get impact of smoking, it is evident that by the time they celebrate their 31st birthday, taking into account that smoking impacts on mortality at the twentieth year of smoking, the signs of smoking effect will be showing (Engel, 1996).

Considering the impact of smoking, which is fifteen to twenty years and the quality of life that they will be displaying, it is assumed that the economy of the country may be affected. The Department of Health (1998) reported that nine out of ten smokers, including teenagers, develop emphysema and lung diseases. This fraction (I.e. 9:10) together with the increase in prevalence (26%) among learners studied makes it possible that the death toll will increase to ten million by 2020 (Department of Health, 1998). Reports indicate that having a father, mother, sister and friend who smoked and having a father who is employed full-time may increase the risk of a learner to start smoking (Sieminska, Janssem, Konopa, Damps & Slominska, 2000; Shamsuddin & Harris, 2000 and Zhu et al., 1996). The findings from our study are in line with these findings and confirm that the social environment has the power to create healthy and unhealthy lifestyles for individuals by playing a role of determinant of health. This is worrying because these factors form part of young people's social life.

Learners in this study are challenged by the extent to which they can have control over the social factors in which they are surrounded with (Morton, Greene & Gottlieb, 1995: 56. All the factors that showed positive association with smoking habits in learners should be taken seriously because they form part of a person's environment and have an impact on health and health behaviour of an individual. It is hoped that the findings in this study will help health promotion programmes in the schools to start training of teachers on how to handle smoking problems of learners. Involvement of teachers in Health Promoting School programmes may enable them to address the issues of smoking such as the effect of nicotine on the body as well as the physiological changes that take place in a smoking person. This can be done by integrating smoking programmes into learning areas of all school grades. Again, integrating health promotion into learning areas may assist learners to make decisions about smoking before they get hooked into this behaviour.

## Conclusion

The study is limited by the fact that a small number of Coloured learners (14) participated in the study. The most important conclusion is that smoking among these learners was predicted by gender, race and area of school.

## Implications for practice

Appropriate health promotion interventions aimed at preventing smoking, should be targeted to all learners in this district.

## Acknowledgement

## References

Aids for Aids. (2005). Clinical guidelines.

Bartlett JG & Gallant JE. (2002). Medical Management of HIV Infection.

Bello, B. (1995). *Trends and patterns of smoking in the South Africa adult population evidence from 19985-1998 data.* Unpublished abstract, University of the Witwatersrand, ParkTown, Johannesburg, South Africa.

Brook, J.S., Morojele, N.K., Brook, B.W., Zhang, C. & Whiteman, M. (2006). Personal, interpersonal and cultural predictors of stages of cigarette smoking among adolescents in Johannesburg, South Africa. *Tobacco Control,* 15(1), 148-153.

Choi, W.S., Harris, K.J., Okuyeni, K. & Ahluwalia, J.S. (2003). Predictors of smoking initiation among college-bound high school students. *Annals of Behavioral Medicine,* 26(1), 69-74.

Department of Health, (1998). Tobacco Action Group in South Africa (2000). *A guide on how to create a smoke free workplace.*

Elder, J.P., Perry, C.L., Stone, E.J., Johnson, C.C., Yang, M., Edmundson, E.W. et al. (1996). Tobacco use measurement, prediction and intervention in elementary schools in four states: the CATTCH study. *Preview Medical Journal,* 25(4), 486-94.

Engel, J. (1996). *The complete South African Health Guide,* Juta, Western Cape.

Epi. Info version 6. (1995). *The Division of Surveillance and Epidemiology, Centres for Disease Control and Prevention,* Atlanta.

Foulds, J. & Godfrey, C. (1995). Counting the cost of children's smoking. *British Medical Journal,* 311, 1152-54.

Goldstein SJ. (1996). *The use of tobacco in Johannesburg high school youth.* Unpublished masters thesis, University of the Witwatersrand, ParkTown, Johannesburg, South Africa.

Grucza, RA. & Bierut, LJ., Cigarette smoking an the risk for alcohol use disorders among adolescent drinkers. *Alcohol Clin Exp Res* Dec;30(12)2046 -54.

Guthrie,T.M., Shung-King, M., Steyn, K. & Mathambo, V. (2000). Children and Tobacco in Southern Africa: A literature review of health effects, youth smoking and tobacco control measures. *Child Health Unit & Medical Research Council.*

Lee, R.M. (1993). Doing research on sensitive topics. London: *Sage.*

Marks, A.S., Steyn, K.S. & Ratheb, E. (2001, March). Tobacco use by Black women in Cape Town. *Policy brie.* Retrieved January 27, 2003, from PubMed database.

Morton, S., Greene, W.H. & Gottlieb, N.H. (1995). *Introduction to health education and health promotion.* Illionis: Waveland Press.

Osaki, Y. & Minowa, M. (1996). Cigarette smoking among junior and senior high school students in Japan. *Journal of Adolescent Health,* 18(1), 59-65.

Padget, D. I., Selwyn, B. J. & Kelder, S. H. (1998). Ecuadorian adolescents and cigarettes smoking: a cross sectional survey. *Review of Panama Saluda Publican,* 4(2), 87-83.

Saati, E., Inan, S., Bozdemir, N., Akpinar, E. & Ergun, G. (2004). Predictors of smoking behaviour of first year University students: questionnaire survey. *Croatian Medical Journal,* 45(1), 76-9.

Shamsuddin, K. & Harris, M.A. (2000). Family influence on current smoking habits among secondary school children in Kota Bharu, Kelantan. *Singapore Medical Journal,* 41(4),167-71

Sieminska, A., Janssem, E., Konopa, K., Damps, I & Slominska, J.M. (2000). The prevalence of cigarette smoking among school pupils staying at summer camps. *Internamational Journal of Tuberculosis and Lung Diseases,*

Smith, M. & Umenai, T. (2000). "Knowledge, attitudes and practice of smoking among University students of allied health sciences in Japan". Retrieved 2 February, 2001 from, *Asia Pacific Journal of Medicine.*

UNAIDS (2002). Report on the global HIV / AIDS epidemic. 2002:153