

RESEARCH ARTICLE

Tobacco-Related Chronic Illnesses: A Public Health Concern for Jamaica

Tazhmoye V Crawford^{1,3*}, Donovan A McGrowder², Jasper D Barnett³, Barbara A McGaw⁴, Irving F McKenzie³, Leslie G James³

Abstract

Background: Tobacco use is a leading cause of preventable morbidity and mortality from non-communicable diseases. The objectives of the study were to determine the percentage of annual income used to purchase tobacco-related products and treat tobacco-related illnesses, and assess the characteristics of smokers and their awareness of the health-related risks of smoking. **Method:** Stratified and snowball sampling methods were used to obtain information (via a 17-item, close-ended questionnaire) from 85 adult respondents (49 males and 36 females). The instrument comprised of demographic characteristics, smoking behavioural/lifestyle, health, and micro socio-economics. **Results:** There were no significant differences between individuals who were affected by chronic obstructive pulmonary disorder (COPD) (14.1%) and cardiovascular disease (18.8%). It was found that respondents spend 30-39% of their annual income on tobacco-related products. Forty percent (40.0%) and 41.7% of respondents with lung cancer and COPD respectively spend more than 50% of their annual income to treat these diseases. The majority (80%) of those who continues to consume tobacco-related products were uncertain as to why they were doing it. Not all the smokers were aware of the dangers of tobacco consumption despite their level of education. **Conclusion:** The majority of the respondents who had tobacco-related illnesses such as lung cancer and COPD spend a significant amount of their income on their health care. Not all the smokers were aware of the dangers of tobacco consumption despite their level of education. This suggests the need for increase public awareness where both smokers and non smokers are being fully or adequately informed about the dangers or health risks of tobacco consumption.

Keywords: Tobacco - smoking - income - risks - consumption - Jamaica

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Introduction

The World Health Organization (WHO) estimates worldwide over 1 billion people currently smoke tobacco, mostly in the form of cigarettes (Lee et al., 2004). Tobacco use is increasing rapidly in many developing countries while declining in some developed countries. The number of smokers is growing, particularly in low and middle-income countries and is expected to reach 1.6 billion by 2025 (Gajalakshmi et al., 2000). It has been established that smoking is already the leading cause of premature death in the developed world and is rapidly reaching that status in the developing world (Caponnetto et al., 2012). Smoking is uniquely harmful. One-half of all long-term smokers will eventually be killed by their habit and, of these, half will die during middle age, losing 20-25 years of life (Peto et al., 2006; Wipfli and Samet, 2009).

The components of cigarette smoke collectively explain its health impacts (WHO International Agency for

Research on Cancer, 1986; Royal College of Physicians, 1998). Smoke contains over 4,000 chemicals including 60 known carcinogens (National Toxicology Program, 2008). Approximately 500 of these chemicals are in the vapour phase (including ammonia, carbon monoxide, hydrogen cyanide, nitrogen oxides, and various hydrocarbons) and over 3,500 in the particulate phase (including 'tars' and most of the carcinogenic agents). Nicotine appears in both phases (Connolly et al., 2007). Cigarette smoking has now been positively and strongly associated with increased morbidity and mortality due to a number of diseases, the most recognized of which is lung cancer (Moolgavkar et al., 2012). In addition, the various substances contained in cigarette smoke are partly responsible for malignant tumours of the oral cavity and the pharynx (United States Department of Health and Human Services, 1984) and are a main risk factor for arteriosclerosis, cerebral thrombosis, myocardial infarction, and chronic obstructive pulmonary diseases (COPD) such as chronic bronchitis and emphysema (Wipfli and Samet, 2009; Grief, 2011).

¹Jamaica's Participant on the Leaders in International Health Programme, Pan American Health Organization/World Health Organization, ³Ministry of Health ²Department of Pathology, Faculty of Medical Sciences, The University of the West Indies, ⁴The Heart Foundation of Jamaica, Kingston, Jamaica *For correspondence: crawfordtazhmoye@yahoo.co.uk

In populations in which cigarette smoking has been common for many decades, approximately 90% of lung cancer, 15-20% of other cancers, 75% of chronic bronchitis and emphysema, and 25% of deaths from cardiovascular disease at ages 35-69 years are attributable to tobacco use (Peto et al., 2006). Tobacco-related cancer constitutes 16% of the total annual incidence of cancer cases, 30% of cancer deaths in developed countries, and 10% of deaths in developing countries (Department of Health and Human Services, 1990; Peto et al., 2006). Several studies have shown that the risks of smoking-related diseases are similar in both current smokers and those affected by secondhand smoke (Barnoya et al., 2005; Hill et al., 2007). In 2000 in industrialized countries there were 0.52 million deaths from lung cancer, 1.02 million deaths from cardiovascular disease, and 0.31 million deaths from COPD, while in the developing world there were 0.33 million deaths from lung cancer, 0.67 million deaths from cardiovascular disease, and 0.65 million deaths from COPD (Ezzati and Lopez, 2004).

Cigarette smoking also has an adverse effect on a country's economy and health care system due to such factors as lost worker productivity, health effects of smoking during pregnancy, increased medical costs and smoking-related fires (United States Department of the Treasury, 1998). The Centers for Disease Control estimates that from 2001-2004, the total economic burden of smoking on a country's economy was \$193 billion a year (Centers for Disease Control & Prevention, 2008). Tobacco-attributed work productivity losses total nearly \$100 billion annually, and smokers miss 50% more work days than nonsmokers (United States Department of the Treasury, 1998; Centers for Disease Control and Prevention, 2008). Government policies and actions such as increased taxation, comprehensive advertising bans, restrictions on smoking in public and workplaces, and health information and counter-advertising have reduced the burden of smoking by preventing initiation, promoting cessation, and reducing exposure to passive smoking (Begg et al., 2007).

The objectives of the study were to determine the percentage of annual income used to purchase tobacco-related products and treat tobacco-related illnesses, and assess the characteristics of smokers and their awareness of the health-related risks of smoking.

Materials and Methods

This paper, which came out of the Leaders in International Health Programme, supported by the Pan American Health Organization/World Health Organization in 2011, utilizes a quantitative approach, representing the collection of primary data during the period August to December, 2011.

Stratified and Snowball sampling methods were used to obtain information (via a 17-item, 2-page, close-ended questionnaire) from 85 adult respondents (49 males and 36 females), who appeared to be of sound minds and were within the age cohort of 17-50 years old. The respondents were informed that the information which they had provided would be treated with the strictest of confidence,

and that should they be desirous of opting-out during the interview process; such option was available at any point in time.

The instrument comprised four overarching considerations: namely, demographic characteristics, smoking behavioral/lifestyle, health, and micro socio-economics. The research is also informed by qualitative approach, which is supported by evidence reported by academic research, policy documents, international agreements, *inter alia*.

The data were stored and analyzed, using the Statistical Package for Social Scientists 17.0 (SPSS Inc., Chicago, Illinois, United States). The analyses calculated a range of central tendencies, cross tabulations and correlation coefficients considered to be statistically significant.

Results

There were no significant differences between individuals who were affected by COPD (14.1%) and cardiovascular disease (18.8%; Table 1). However, those who had other complaints that compounded existing illnesses (such as hypertension, diabetes mellitus and renal problems) were highest (37.6%). Of the 85 smokers (49 male, 36 female) of tobacco products, 62.3% suffers from tobacco-related chronic illnesses and spends more than 30% of their income to treat such health issues; reflecting a negatively skewed distribution. This was more prevalent among males than females within the ages of forties (34.7%) and thirties (22.2%) respectively (Table 1).

It was found that 40.0% and 41.7% of respondents with lung cancer and COPD respectively spend more than 50% of their annual income to treat their health conditions. In addition, 57.1% of the respondents with emphysema spend 20-29% to treat this health condition.

It was found that 80% of those who continued to consume tobacco-related products (mainly cigarettes) were uncertain as to why they were doing it (Table 2). However, there were those who after a while, did not smoke as frequently as before, particularly because they became health conscious (93.3%). Other health conscious persons claimed to have been rehabilitated (18.9%) and quit totally (88.9%). Most of these individuals were

Table 1. Annual Percentage Income Spent on Tobacco-Related Chronic Illnesses

Type of Illness	Annual Percentage Income				
	<20%	20-29%	30-39%	40-49%	≥50
Lung Cancer	0.0	0.0	40.0	20.0	40.0
Chronic Obstructive Pulmonary Disorder	8.3	0.0	25.0	25.0	41.7
Cardiovascular disease	12.5	25.0	18.8	12.5	31.3
Emphysema	0.0	57.1	28.6	14.3	0.0
Periodontal Gum Disease	0.0	0.0	33.3	33.3	33.3
Head/Neck Malignancy	14.3	28.6	14.3	14.3	28.6
Others	66.7	33.3	0.0	0.0	0.0
Total	101.8	144.0	160.0	119.4	174.9

uncertain as to why they were in the habit of smoking (27.1%), followed by those who said that they grew up with parents/guardians who constantly smoked around them (23.5%; Table 2).

Not all the smokers were aware of the dangers of tobacco consumption despite their level of education. The majority of those who become aware during their period of smoking, attained secondary and tertiary education (16.1% and 13.8% respectively). This was followed by those who were oblivious and attained a similar level of education (9.5% and 8.1% respectively; Table 3). All the respondents were employed and claimed to be earning more than US\$5.00 per day, the majority of whom spent on average 30-39% of their annual earnings on tobacco-related products (37.6%) and smoked on a daily basis. This reflects a positive skewness with mean and standard deviation of 2.95 and 1.23 respectively (Table 3).

The amount of money spent daily on tobacco-related products was lesser than that which was spent on tobacco-related chronic illness (Table 4). For instance, majority of the respondents spent 40-49% of their annual income on the latter, yet at the same time, spent 30-39% of their annual income on the former, that is 77.8% individuals. The percentage annual income spent on tobacco-related illness when compared with the percentage annual income spent on tobacco-related products for consumption, shows a mild association ($C=0.274^{**}$; $\alpha=0.01$; Cramer=0.116).

Table 2. Tobacco Consumption Status

Current Status	Reason for Status			
	Uncertain	Health Conscious	Divine Intervention	Others
Continues to smoke	80.0	0.0	0.0	20.0
Does not smoke as frequently as before	0.0	93.3	6.7	0.0
Rehabilitated	0.0	18.9	0.0	0.0
Quit smoking totally	0.0	88.9	11.1	0.0
Total	80.0	201.1	17.8	20.0

Table 3. Awareness of the dangers of smoking by highest education level

Awareness	Highest Education Level (%)			
	Pre-Primary	Primary	Secondary	Tertiary
Prior to smoking	1.1	1.6	6.2	5.3
During smoking	2.8	4.1	16.1	13.8
After quitting	0.6	0.8	3.3	2.8
I was not aware	1.6	2.4	9.5	8.1
Total	6.1	8.9	35.1	30.0

Table 4. Percentage Annual Income Spent on Tobacco-Related Illnesses and Health Care

Health Care	Tobacco Product				
	<20	20-29	30-39	40-49	≤50
<20	0.0	0.0	50.0	16.7	33.3
20-29	18.2	27.3	27.3	0.0	27.3
30-39	16.7	25.0	25.0	8.3	25.0
40-49	0.0	11.1	77.8	11.1	0.0
≤50	13.3	13.3	53.3	0.0	20.0
Total	48.2	76.7	233.4	36.1	105.6

Discussion

Smoking represents one of the most significant behavioural threats to the health of persons because of the devastating consequences of tobacco use, such as premature death and morbidity (Samet, 2010). Most of the respondents in this study were affected by a number of tobacco-related illnesses such as lung cancer, COPD, cardiovascular disease, emphysema, periodontal gum disease, head and neck malignancy. It has been reported in the literature that tobacco use has been attributed to nearly all lung cancers (approximately 87-91% in males and 57-86% in females along with most cancers of the esophagus, larynx, and oral cavity (Dreyer et al., 1997).

In keeping with the findings of Table 1, smoking is increasingly being recognized as a major risk factor for poor periodontal health. Numerous observational-type, cross-sectional and longitudinal studies establish a strong correlation between the increase tobacco usage and poor periodontal health (Johnson and Slach, 2001; Kumar et al., 2008; Singh et al., 2011). Empirically, the data reveal both a linear and a direct correlation between smoking and clinical attachment loss. Attempts at gaining an in-depth understanding of the potential mechanisms whereby smoking can negatively impact periodontal health have lead to several studies. The pathophysiological mechanisms that have been postulated to date on the pathogenesis of periodontal disease are: (i) immune suppression from the impact on humoral, cellular immune and inflammatory systems mediated systemically mainly as a result of the suppression of the function of the neutrophils (PMN leukocyte function), thereby altering the rate of chemotactic migration (Mustapha et al., 2007). Other possible cause may be due to increase in TNF- α and PGE2 in the gingival crevicular fluid (GCF) (Geivelis et al., 1993); increase in the neutrophilic collagenase and elastase in GCF (Suomalainen, 1992); a reduction the skeletal bone mineral content and impairment of the serum antibody response to local periodontal pathogen (Kim and Amar, 2006), and (ii) the impact locally on the vasculature by vasoactive and cytotoxic substances from the tobacco (Mikelsone et al., 2011). Other impact of smoking on periodontal disease includes: delayed wound healing, alteration in the colour and moisture of the oral mucosa, failure of dental implants, and changes in the smell of the smokers breath resulting in a sort of smoking halitosis (Braig and Rajan, 2007; Ahn et al., 2008).

Tobacco use is also a significant risk factor for cancers of the bladder, pancreas, kidney, stomach, cervix, and nose, as well as myeloid leukaemia (Castellsaque et al., 2006). Several studies have established a direct causal link between tobacco use and cardiovascular disease (Huxley and Woodward, 2011), and smokers have a 2-3 fold higher relative risk of coronary heart disease (Peto et al., 2006; Kara et al., 2009). They are at serious risk for sudden cardiac death due to acute coronary thrombosis and stroke (Hashimoto, 2011). It is also well documented that tobacco smoking also causes COPDs such as chronic bronchitis and pulmonary emphysema, as reported by respondents in this study. Chronic respiratory diseases also play an important part of mortality after cardiovascular

diseases and stroke (World Health Organization, 2005; Phommachanh and Vang, 2007).

It has been reported that approximately 1,100 smokers die every day from smoking-related illnesses, and more than 3,000 quit (United States Department of Health and Human Services, 1990). Pierce and colleagues (1994) using data from National Health Interview Surveys estimated that it will take an average of 16-20 years of addicted smoking before the average adolescent, who reaches a lifetime consumption of one hundred cigarettes, will be able to quit successfully. In this study we found that the majority of the respondents who quit smoking did so because they became health conscious and were more aware of the risks of tobacco consumption. There were also those respondents who reduced their frequency of smoking cigarettes for the same reason. Other health conscious persons claimed to have been rehabilitated. The desire to quit smoking for health reasons have been documented in the literature whereby West and colleagues (2001) in their study reported that many smokers wanted to quit due to health concerns. They posit that although a smoker's concern about the effects of smoking on future health and well-being may be associated with a desire to quit smoking, it may not be related to a successful attempt to quit. This is influenced by a number of factors including the degree of dependence that smokers have on cigarettes or other tobacco product (West et al., 2001). This suggests that knowledge about the health risks of smoking may encourage persons not to start smoking but may not be important in persuading them to discontinue smoking once they have started (Whitaker and Hughes, 2003).

Parents and other family members are role models for youths and are a main source of primary socialization. Children growing up in poverty and social or financial deprivation are more likely to live in homes where parents and/or siblings smoke. It is therefore not surprising that these children are more likely to smoke (Office for National Statistics, 1997). The Global Youth Tobacco Survey (2001) conducted in Jamaica showed that approximately 36% of the 1,742 students reported smoking their first whole cigarette before they were 10 years old (Warren, 2001). A very interesting finding of this study is that just over one fifth of respondents who continue to smoke indicated that they grew up with parents or guardians who constantly smoked around them. Children are almost three times more likely to become regular smokers if both their parents smoke than if neither parent does (Office for National Statistics, 1996). Ironically, Bauman et al (1990) suggested that parents who have smoked in their lifetime are more likely to express opposition clearly and explicitly to their children smoking than are parents who have never smoked.

The majority of respondents in this study who continued to consume tobacco-related products (mainly cigarettes) were uncertain as to why they were doing it. These respondents did not provide reasons why they continued to smoke. In a study by Memon and colleagues (2000) of 4,000 participants selected using a three-stage stratified cluster sampling design, the respondents gave a number of reasons for quitting which includes harmful effects on health, setting a bad example for the children,

scientific evidence of the hazards of smoking, messiness of the habit, influence of spouse or other family members, and did not really enjoy smoking. There are others studies that have cited that smokers continue to smoke as a means of reducing stress (Ayyagari and Sindelar, 2010), and that it is a habit that is difficult to give up (West et al., 2001). This suggests that smoking has an intrinsic reinforcing effect for many smokers.

Most smokers are not fully or even adequately informed about the risks of smoking, as we found that not all respondents were aware of the dangers or risks of tobacco consumption despite their level of education. Chapman and Liberman (2005) posits that being fully or adequately informed involved having heard that smoking increases health risks; being aware that particular diseases like lung cancer and emphysema; accurately appreciating the meaning, severity, and probabilities of developing tobacco related diseases; and smokers agreeing that their smoking poses significant risk to their own health. Having reviewed international evidence on smokers' recognition of vulnerability to harm, Weinstein (2001) posits that while smokers have a reasonably accurate perception of the health risks faced by smokers as a group and acknowledge some risk, there is a tendency to believe that the risk applies more to other smoker than themselves.

Education and socioeconomic factors have been associated with smoking in most populations (Sunstein, 2000; Cheah and Naidu, 2012). It is likely those financially challenged and less educated people are less aware of the health hazards of tobacco consumption. They are more likely to find themselves in conditions predisposing them to initiate tobacco use, and more likely to have higher overall risk taking behavior (Denscombe, 2001). However, the findings of the study highlight the fact that some educated individuals lack awareness of the dangers and risk of smoking as some of the respondents, though in the minority, who became aware during their period of smoking, attained secondary or tertiary education, with a similar amount who were oblivious, attained the same level of education.

In low and middle income countries like Jamaica, tobacco smoking is linked with poverty and poor education (Hosseinpoor et al., 2011). Tobacco is often a significant part of total family expenditure, and a lot of money is spent on tobacco at the individual and household levels thus depriving the family of basic necessities, such as food, shelter, education and health care. In this study all the respondents were employed and less than one half spent on average 30-39% of their annual earnings on tobacco-related products, and smoked on a daily basis. The expenditure by the respondents in this study seemed to be higher than those of smokers in other countries. Low income households with at least one smoker in Bulgaria spent 10.4% of their total income on tobacco products in 1995 while in China, smokers in 2,716 households in Minhang district spent 17% of household income on cigarettes (Bobak et al, 2000; World Bank, 2001). Further, research on the financial implications of smoking is scant. Stronks et al. (1997) using a Dutch sample, reported that financial stress indicated by difficulty in payment of bills, food and rent among other basic necessities was

associated with smoking status. In a more recent study, Siahpush et al. (2003) using Australian data showed that households reporting tobacco expenditure were more likely to experience financial stress. This suggests that interventions to encourage smoking cessation among the respondents in this study with financial difficulties are likely to enhance their material conditions, standards of living, and quality of life.

Tobacco users are at much higher risk of suffering from tobacco-related diseases, thus imposing additional health related cost on themselves and their families. It was found that approximately two fifths of respondents with lung cancer and COPD spend greater than 50% of their annual income to treat their health conditions, while approximately three fifths with emphysema spend 20-29% to treat this health condition. For those respondents who were ill, the sum of money spent on treatment for tobacco-related chronic illness was greater than that spent on the consumption of tobacco-related products. These individuals are more likely to have significant financial difficulties as a result of their continued use of tobacco products. The money spent on treatment for tobacco-related chronic illness may include out-of-pocket expenditure for both inpatient and outpatient health care. The quality of health care that these smokers are able to afford will depend on their wealth status and whether they have health insurance. The average cost of inpatients rises in relation to the duration of stay in the hospital. We expected that low income earners would spend less on hospital care than those with higher income. The number of times that these respondents with tobacco-related illness sought medical attention will depend on their health seeking behavioural practices.

In conclusion, we found that the majority of the respondents had tobacco-related illnesses and those with lung cancer spend a significant amount of their income on their health care. Some of the respondents indicated that they quit smoking because they became health conscious while others continue and were uncertain of why they continued to do so. Not all the smokers were aware of the dangers of tobacco consumption despite their level of education. This suggests the need for increase public awareness where both smokers and non smokers are being fully or adequately informed about the dangers or health risks of tobacco consumption. Communications to public and private agencies, as well as non-governmental organizations in Jamaica should be encouraged to increase their awareness of and participation in tobacco control programs. Tobacco use cessation programs and initiatives which are culturally sensitive and gender-specific should target institutions such as schools, healthcare facilities, workplaces, sporting, and other group environments. Treatment modalities such as behavioural and pharmacological therapies for smokers who are willing to quit should be available at public health and primary care services.

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