

Prevalence of second hand smoke exposure among adults in Bulawayo, Zimbabwe.

by

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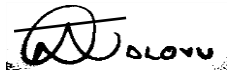
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DECLARATION

I declare that the mini-dissertation hereby submitted to the University of Limpopo, for the degree of Master of Public Health has not previously been submitted by me for a degree at this university or any other university; that it is my work in design and in execution, and that all the material contained herein has been duly acknowledged.



Ndlovu, N (Mr)

15 February 2016

Date

DEDICATION

I dedicate this work to my wife as well as to grandmothers maSibanda and maNdlovu.

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Firstly, I would like to acknowledge the Lord Almighty for His grace and providences throughout the duration of this dissertation and beyond.

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ABSTRACT

Introduction: Annually, hundred thousands of people worldwide die as a result of second hand smoke (SHS) exposure. There is no safe exposure level to SHS yet in Bulawayo, smokers have been observed smoking without restraint thus exposing non-smokers to SHS. The purpose of this study was to establish the prevalence and contributing factors of SHS exposure among adults in Bulawayo, Zimbabwe.

Methods: A cross sectional study was conducted and participants were randomly selected from residents who visited the 13 municipal revenue halls. A structured questionnaire was used to collect data from respondents. Descriptive and multivariate logistic regression analyses were performed.

Results: Home SHS exposure prevalence was 22% and females were 2.11 times more likely than males to be exposed at home. Prevalence of SHS exposure in public transportation, health facilities, educational and food premises was 40.9%, 26.3%, 42,9% and 36.8% respectively.

Conclusion: SHS exposure in Bulawayo was high and there is need to reduce SHS exposure to non-smoking adults.

Keywords: Second hand smoke (SHS), Bulawayo, Prevalence, Exposure, Adult

DEFINITION OF TERMS

- Adult:** any person aged 18 and above is deemed to be an adult according to the General Law Amendment Act (Zimbabwe, 2006). Therefore, an adult in this study is regarded as any individual who is aged 18 and above.
- Exposure:** concentration or amount of a particular chemical that reaches a target organism, system, population or sub-population in a specific frequency for a defined duration (Department of Health Australia, 2012). Exposure in this study refers to the amount of second hand smoke that reaches an adult resident of Bulawayo.
- Prevalence:** frequency of existing cases in a defined population at a given point (Bonita, Beaglehole & Kjellstrom, 2006). Therefore, prevalence in this study refers to the proportion of second hand smokers in the non-smoking population (Wang, Ma, Xu, Wang, Mei, Yang, 2009).
- Second hand smoke:** the smoke emitted from the burning end of a cigarette or from other tobacco products usually in combination with the smoke exhaled by the smoker (WHO, 2013).
- Second hand smoking:** inhalation of tobacco smoke from the environment by non-smoking persons (WHO, 2005; International Agency for Research on Cancer, 2004).

LIST OF ABBREVIATIONS

CDC	Centers for Disease Control
ETS	Environmental Tobacco Smoke
GATS	Global Adult Tobacco Survey
GYTS	Global Youth Tobacco Survey
IARC	International Agency for Research on Cancer
NRC	National Research Council (United States of America)
SHS	Second Hand Smoke
SIDS	Sudden Infant Death Syndrome
WHO	World Health Organization

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CHAPTER 1

1.1 INTRODUCTION AND BACKGROUND

Every year, millions of people die from tobacco use and several hundred thousand die from exposure to second hand smoke (SHS). Families, industries and nations suffer from these preventable deaths. The World Health Organization (2005) indicates that more than 5 million people die annually from tobacco use and more than 600 000 die annually from second hand smoke exposure. It is disturbing that such a large number of people (600 000) die due to unintentional smoking. Passive smoking, which is unintentional smoking, is the inhalation of smoke, called second hand smoke (SHS) or environmental tobacco smoke (ETS), by persons other than the intended "active" smoker. Passive smoking occurs when tobacco smoke permeates any environment and is inhaled by people within that environment (WHO, 2005; International Agency for Research on Cancer [IARC], 2004).

SHS contains more than 4000 chemicals including about 70 carcinogens (US Department of Health and Human Services, 2006; IARC, 2004). Due to the presence of these chemicals, SHS exposure has been associated with cancer, cardiovascular and respiratory diseases in adults and severe asthma attacks, respiratory infections, ear infections, sudden infant syndrome, cognitive impairment in children (Institute of Medicine, 2009; IARC, 2004). The health risks of SHS are a matter of scientific consensus (Tong & Glantz, 2007; WHO, 2005; IARC, 2004). Furthermore, it should be noted that there is no safe level of exposure to SHS (WHO, 2013).

At a global scale, WHO came up with the Framework Convention for Tobacco Control (FCTC) in realisation that the tobacco epidemic with its attendant serious consequences for public health was a global problem requiring "the widest possible international cooperation and the participation of all countries in an effective, appropriate and comprehensive international response" (WHO, 2005:1). The WHO FCTC entered into force in February 2005 and there are 170 countries that have ratified or acceded to it (WHO, 2015). Countries that ratify or accede to this treaty commit themselves to reduce demand for tobacco through price and tax measures and through non price measures such as protection from exposure to tobacco smoke (WHO, 2005).

At a national level, many governments such as Australia, Canada, Gabon, New Zealand Senegal, South Africa, to name but a few, have enacted smoke-free laws in workplaces, indoor public places and in some open public spaces such as beaches and public parks in order to protect non-smokers. Zimbabwe is one of the countries that have enacted

regulations on tobacco control. The regulations, among other issues, control tobacco smoking in public premises such as food premises, hospitals, public meeting halls, schools as well as in public transport. Furthermore, the country is a party to the WHO FCTC after acceding to the treaty in December 2014.

Drope (2011) notes that tobacco control legislation and policies are developed in many countries but the tepid response and lacklustre attention paid to implementation thwarts the well intentioned efforts. Sadly, the scenario is no different in Zimbabwe. Despite the tobacco control regulations having been promulgated in 2002, more than ten years ago, their implementation and enforcement has not really been serious. The political will has not yet been consummated and the lure of financial gains obtained from the tobacco industry, as noted by Drope (2011) of most countries in Africa, continues to exact hardships on the tobacco control efforts. Zimbabwe is the fourth largest producer of tobacco in the world and the country's economy is heavily dependent on tobacco (Biomedical Research and Training Institute, 2008). Tobacco is known as the "gold leaf" of the country raking in more than US\$ 500 million annually in exports. The Biomedical Research and Training Institute (2008) notes that financial gains from tobacco have resulted in tobacco control policies getting low priority from the government. According to media reports (Chronicle, 2014; Musarurwa, 2014; Newsday, 2012; Sunday Mail, 2014) the tobacco industry is not willing for the government to implement tobacco control provisions in full as they fear the financial losses that the industry would incur. The industry wants the government to use its position as a party to the WHO FCTC not to advance tobacco control efforts but to campaign from within the FCTC Convention of Parties against some tobacco control recommendations (Musarurwa, 2014). The industry would obviously want to see the current tobacco situation continuing.

In Bulawayo, the second largest city of Zimbabwe, smokers have been observed smoking in public places such as bus termini, restaurants and hospitals without restraint. This indiscriminate smoking exposes non-smokers to second hand smoke that has a potential of causing adverse health effects. However, the extent of tobacco smoke exposure to adult non-smokers was not known. A search of literature had not revealed any empirical data on the prevalence of second hand smoking in Bulawayo. The only available literature was the Biomedical Research and Training Institute (2008) that reported that in the Global Tobacco Youth Survey conducted in 2008, 22% of the youths (aged 13-15 years) were exposed to SHS within their homes whilst 48% were exposed to SHS in places outside their homes. The present work is an attempt to document the prevalence of SHS exposure among adults in Bulawayo and the factors contributing to the prevalence.

1.2 STATEMENT OF THE PROBLEM

Second hand smoking has been shown to be responsible for medical conditions such as lung cancer, cardiovascular and respiratory diseases in non-smokers and is also responsible for more than 600 000 deaths annually worldwide (WHO, 2005). There is no safe level of exposure to second hand smoke and even brief periods of exposure to low levels of tobacco smoke are capable of causing adverse health effects (WHO, 2013). However, in Bulawayo, there is indiscriminate smoking in both private and public places. Non-smokers are being exposed to this air pollutant with its attendant health hazards. This indiscriminate smoking is occurring despite the presence of tobacco control legislation that is meant to protect people from such exposure. The extent to which non-smokers were exposed was not known as well as the factors that contributed to the prevalence of second hand smoking in Bulawayo.

1.3 PURPOSE OF THE STUDY

The purpose of this study was to establish and understand the prevalence of second hand smoke exposure among adults in Bulawayo, Zimbabwe.

1.4 RESEARCH QUESTION

What is the prevalence of second hand smoking among adults in Bulawayo, Zimbabwe?

1.5 OBJECTIVES

1. To determine prevalence of second hand smoke exposure among adults in Bulawayo, Zimbabwe.
2. To establish factors contributing to the prevalence of second hand smoke exposure among adults in Bulawayo, Zimbabwe.

1.6 CONCLUSION

This chapter sought to briefly introduce the study on prevalence of second hand smoking among adults in Bulawayo. Detailed information on second hand smoking literature, study methodology and results will follow in the subsequent chapters. The next chapter discusses second hand smoking literature.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Tobacco smoking has been and continues to be one of the world's health problems. Tobacco affects both the smoker and the innocent person next to the smoker. It has been implicated in millions of deaths and diseases. The spread of the tobacco epidemic is facilitated through a variety of complex factors such as trade liberalisation, direct foreign investment, global marketing, transnational tobacco advertising, promotion and sponsorship (WHO, 2005). This chapter will seek to review the literature that is available on the tobacco epidemic, particularly on second hand smoking exposure. Thomas and Hodges (2010) suggest that literature review is a systematic study of existing research and other published information on a specific topic with a purpose to identify key information relevant to the subject matter of interest and to evaluate research methods that have been used in previous related studies. This chapter will therefore, in a systematic manner, seek to present key information and study findings on second hand smoke (SHS).

2.2 COMPOSITION AND HEALTH EFFECTS OF SECOND HAND SMOKE

Second hand smoking is the indirect inhalation of tobacco smoke from smokers. It is also referred to as environmental tobacco smoking, passive smoking or involuntary smoking (WHO, 2010a). Whilst the terms passive and involuntary smoking bring out the idea that a non-smoker does not purposefully engage in introducing tobacco smoke into his/her body, WHO (2010a) notes that these terms seem to suggest that while involuntary or passive smoking is not acceptable, voluntary or active smoking is. Thus, 'second hand smoking' is a preferred term with most scientific publications.

SHS contains more than 4000 chemicals and about 70 of the chemicals such as formaldehyde, acetaldehyde, benzene, and nitrosamines are carcinogenic (IARC, 2009; IARC, 2004 & US Department of Health and Human Services, 2006). These chemicals will inevitably cause ill health when introduced into the body. It should be noted that the health risks of SHS are a matter of scientific consensus (IARC, 2004; Tong & Glantz, 2007; WHO, 2009a) and these ill-effects of SHS have been recorded since 1928 (Oberg, Jaakkola, Woodward, Peruga & Prüss-Ustün, 2011). The tobacco industry however, has commissioned its own scientists who have tried to counter studies exhibiting adverse health effects from SHS exposure (Tong & Glantz, 2007; WHO, 2009a). Be that as it may, there

has been overwhelming evidence on the health hazards of SHS as a number of scientific agencies such as the IARC, Institute of Medicine, US Department of Health and Human Services and WHO have reported several associations between SHS exposure and ill health.

The ill-health effects of SHS exposure have been observed in both the young and the old. According to the US Department of Health and Human Services (2006) there is a lot of scientific evidence showing that children who are exposed to their parents' smoking get sick more often. Their lungs grow less than those of children who are not exposed to SHS. Studies mostly conducted in developed countries have shown that medical conditions such as asthma, bronchitis, pneumonia, wheezing and coughing are more common in children who are exposed to tobacco smoke than in those who are not (Schmidt, 2013; Tager, 2008; Treyster & Gitterman, 2011; WHO, 2010b).

SHS exposure is also associated with Sudden Infant Death Syndrome (SIDS) (Schmidt, 2013; Treyster & Gitterman, 2011; WHO, 2010a). The American Academy of Paediatrics (2005) defines Sudden Infant Death Syndrome as the sudden, unexplained and unexpected death of a child in the first year of life. The diagnosis of SIDS is not common in Zimbabwe but all the same this should alert us to the possible ill effects of SHS in children. SHS should be handled as a public health priority for the national government. Such high priority will help initiate and drive programmes that will sensitize the public at large on the dangers of SHS.

SHS not only affect children health wise, but it also does affect them academically. Clear (2015) and Canadian Cancer Society (2015) suggest that SHS exposure introduces learning difficulties and neurobehavioral problems in children. It is reasonable to suspect that in an area where SHS exposure is common a number of the children may be affected academically. Thus the cognitive capability of children is an important factor to be considered wherever SHS exposure abounds.

In adults a number of medical conditions such as cancer, aggravated lower respiratory tract conditions, cardiovascular diseases, mental disorders, asthma to mention but a few, are associated with SHS exposure. Numerous authors (IARC, 2009; Brennan, Buffler, Reynolds, Wu, Wichmann & Agudo, 2004; California-Environmental Protection Agency, 1997; National Research Centre, 1986; US Department of Health and Human Services, 1986) have long reported the association between lung cancer and SHS. According to Centres for Disease Control (2013) people who are exposed to SHS, increase their risk of developing lung

cancer by as much as 20-30% and the California-EPA (2005) indicates that there is a causal association between SHS exposure and nasal sinus cancer as well as breast cancer in premenopausal women. The presence of carcinogenic chemicals in SHS may explain the reported associations between SHS and various cancers.

SHS exposure is one of the major causes of cardiovascular diseases and in adults it has been shown to increase the risk of coronary heart disease by approximately 25–30% (Institute of Medicine, 2009 & US Department of Health and Human Services, 2010). Additional evidence suggests increased risks even at the lowest levels of exposure, and data from cellular and animal experiments indicate that effects of SHS on the cardiovascular system are plausible (Institute of Medicine, 2009). This view that there is enough evidence to infer a causal association between SHS and cardiovascular effects is also shared by Barnoya and Glantz (2006) and Zhang, Shu, Yang, Li, Xiang, Gao, Li and Zheng (2005) who state that even an occasional exposure to SHS can result in adverse cardiovascular changes such as increased platelet aggregation, endothelial dysfunction, and arterial stiffening.

According to Barnes, Haight, Mehta, Carlson, Kuller and Tager (2010) individuals who have been continuously exposed to tobacco smoke from an active smoker for more than 25 years have a triple fold risk of dementia. On the other hand, Asbridge, Ralph and Stewart (2013) after their cross sectional study on private space SHS exposure and the mental health of adult non-smokers in Canada concluded that SHS exposure among non-smokers was associated with increased anxiety disorders, poor mental health and high stress.

SHS exposure is also associated with asthma in non-smoking adults (Nguyen, King & Dube, 2014; Oberg et al, 2011; Vozoris & Loughheed, 2008). In 2004, 36 900 worldwide deaths from asthma were attributable to SHS exposure. SHS in the same year was also estimated to have attributed to 379 000 deaths from ischaemic heart disease, 165 000 from lower respiratory infections and 21 400 from lung cancer (Oberg et al, 2011). With such high numbers of deaths, it is worrying that a large number of people do not realize the detrimental effects of SHS exposure to their lives. According to the ITC Project, WHO and World Heart Federation (2012) non-smokers who did not believe or know that SHS exposure could cause heart diseases ranged from 88% in Vietnam to 5% in Thailand. This suggests that worldwide there is generally a knowledge gap on the detrimental effects of SHS exposure.

The health effects of SHS exposure are grave. Considering that there is no risk-free level of exposure to second hand smoking, according to the US Department of Health and Human Services (2006) and WHO (2013), it is necessary to conduct prevalence studies so that appropriate public health interventions can be carried out to prevent avoidable morbidity and mortality among our population.

2.3 MEASUREMENT OF SECOND HAND SMOKE EXPOSURE

In designing appropriate public health interventions for tobacco control it is important to be aware of the prevalence of SHS exposure in that given area. Various direct and indirect methods have been used to estimate the prevalence of exposure to SHS among non-smokers. These range from simple questionnaire reports to measurements of tobacco smoke markers in the environment, human fluids and tissues (IARC, 2009; WHO, 2010b).

Biomarkers that have been used in direct measurement of SHS exposure include urinary, blood, salivary and hair cotinine and these have been used in a number of SHS exposure prevalence studies. Haw and Gruer (2007) used salivary cotinine in their study to measure changes in adult non-smokers' exposure to SHS in public and private places after smoke free legislation was implemented in Scotland. The study noted that salivary cotinine was a stable, highly specific and sensitive biomarker of both active and passive absorption of tobacco smoke. In a study to evaluate directly measured SHS exposure and asthma health outcomes, Eisner, Klein, Hammond, Koren, Lactao and Iribarren (2005) used hair nicotine as means of measuring SHS exposure.

Whilst the use of biomarkers in improving the validity of SHS exposure results is appreciated it should be noted that collection of biomarkers such as blood cotinine can be fraught with some cultural, ethical, financial and logistical difficulties in large population surveys especially in developing countries such as Zimbabwe. The cost of analysing biomarkers might be prohibitive for large population surveys and people might be unwilling to give blood samples to strangers. Furthermore, biomarkers such as salivary cotinine can be influenced by the respondents' age, gender, race, oral pH, type of diet, dehydration, or drug treatment (Avila-Tang et al, 2012) and if adjustments for these parameters are not addressed there can be distortions on SHS exposure results.

Tobacco smoke can also be sampled either actively, using a pump that passes air through a filter or a sorbent, or passively, using a badge that operates on the principle of diffusion (WHO, 2010b). In Eisner et al (2005) participants were instructed to wear personal nicotine

badge monitor during their regular activities for seven days. In a personal nicotine badge a polystyrene cassette 4 cm in diameter holds a filter treated with sodium bisulfate and a membrane filter functions as a windscreen. Ambient nicotine diffuses to the treated filter where it is trapped. The collected nicotine is analysed by gas chromatography with nitrogen selective detection (Avila-Tang et al, 2012).

According to WHO (2010b) the number of smokers, parent smoking and number of cigarettes smoked can be used as indirect measurements of SHS exposure and are usually ascertained by use of a questionnaire. Questionnaires are the most commonly used tool to capture self-reported retrospective and current SHS exposure among the population as well as variability in the duration and perceived intensity of exposure in different settings (Avila-Tang et al, 2012; Perez-Rios, Schiaffino, Lopez, Nebot, Galan, Fu, Martinez-Sanchez, Moncada, Montes, Ariza & Fernandez, 2012). Several large population based surveys, such as the National Health and Nutrition Examination Survey (NHANES) in US, the Global Youth Tobacco Survey (GYTS), the International Tobacco Control (ITC) survey and the Global Adult Tobacco Survey (GATS) as well as a number of smaller scale SHS surveys have used questionnaires to measure SHS exposure (Ali, 2010; Avila-Tang et al, 2012). Furthermore, according to DePoy and Gitlin (2011), questionnaires have an advantage of increased chances of obtaining honest responses as well as having a large number of people answer questions in a short period. DePoy and Gitlin (2011) further argue that questionnaires allow easier comparison of responses as well as easier statistical analysis in describing and comparing responses.

Perez-Rios et al (2012) analysed more than 300 studies that used questionnaires in ascertaining SHS exposure and noted that there was a high variability in the indicators and items used to ascertain exposure. They thereafter, concluded that there was need to have a standard set of items to identify SHS exposure. Avila-Tang et al (2012) on the contrary, seem to suggest that to maintain reliability and validity, the materials' language, microenvironments and administration must be contextually appropriate. They further suggest that the inclusion of some SHS exposure questions should be guided by local smoke-free practices of the population of interest. It should be noted that a standard set of questions as suggested by Perez-Rios et al (2012) might not be able to be contextually appropriate in all settings and as a result might fail to accurately capture local SHS practices. The considered view of this researcher is that the only need is to validate questions used to measure SHS exposure and not for a standard set of questions.

2.4 SECOND HAND SMOKING LEGISLATION

As a result of the reported adverse health effects related to second hand smoking, a number of countries and health authorities have established legislation and policies to prevent SHS exposure. WHO, recognising the general adverse health effects of tobacco smoking, initiated the WHO Framework Convention on Tobacco Control in February 2005. Article 8 of this treaty focuses on protection from exposure to tobacco smoke. This article recognises that each party should adopt and implement effective legislative, executive, administrative and/or other measures necessary for protection of non-smokers from tobacco smoke exposure in indoor workplaces, public transport, indoor public places as well as other appropriate public places (WHO, 2005). It is clear from this article that non-smokers have to be protected from SHS exposure.

Legislation is momentous in effectively protecting non-smokers from SHS. WHO (2015) states that legislation institutionalises and makes binding a country's commitment for tobacco control and it creates focus for tobacco control activity while regulating private and public conduct in ways that voluntary measures cannot. According to WHO (2014), 111 countries that are a Party to the WHO FCTC have enacted laws to protect their citizens from exposure to tobacco smoke by applying a ban (either complete or partial) on tobacco smoking in indoor workplaces, public transport, indoor public places and, as appropriate, other public places. This shows that many governments are conscious of the public health dangers that can be posed to non-smokers by tobacco smoke.

Public health rewards of smoke-free-laws have been well established and substantiated empirically (Drope, 2011). In a study by Haw and Gruer (2007) that sought to evaluate the impact which smoke-free legislation had on SHS exposure within one year of implementation in Scotland, it was established that the implementation of Scotland's smoke-free legislation had been accompanied by a large reduction in SHS exposure within one year of implementation. The study used interviews and cotinine measurements to evaluate the impact of legislation and this aided in improving the validity of the study results. In support, Callinan, Clarke, Doherty and Kelleher (2010) after a review of more than 30 studies on SHS exposure concluded that there was consistent evidence showing that smoking bans reduced exposure to SHS in workplaces, restaurants, pubs and in public places. Not only has legislation brought a reduction in SHS exposure but it has been shown to have reduced the incidence of acute coronary conditions (Lightwood & Glantz, 2009; Mackay, Irfan, Haw & Pell, 2010). Furthermore, a review of research studies according to Lightwood & Glantz

(2009), estimated that there was a 15% reduction in acute myocardial infarctions after implementation of strong smoke-free laws.

In Bulawayo, Zimbabwe the Public Health (Control of Tobacco) Regulations, 2002 also known as Statutory Instrument 264 of 2002 regulate tobacco control. The Public Health (Control of Tobacco) regulations are national regulations promulgated under the Public Health Act Chapter 15:07 and they prohibit smoking in public transport and public premises. The public premises that are referred to in the regulations include health care premises, educational facilities, youth centres, libraries, theatre, cinema, museum, places of worship, public meeting hall or any other public premises.

The tobacco control regulations provide for the designation of smoking areas within public premises or food premises. The area so designated should not exceed 20% of the total floor area in which it is situated and should be so situated as to ensure that smoke from the smoking area does not contaminate the non-smoking area. Whilst the intention of the regulations to protect non-smokers from exposure to tobacco smoke is clear, it has been proven that non-smokers are inevitably exposed to tobacco smoke from the smoking areas. According to Lambert and Donley (2013:2) a study conducted in Australia demonstrated that providing separate areas for smokers and non-smokers provided “little to no protection” from environmental tobacco smoke. They further indicated that another study of restaurants conducted in 2012 in Pretoria, South Africa, found high levels of smoke pollution in non-smoking areas of restaurants. The data suggested that such smoke pollution was coming from designated smoking rooms

Whilst WHO (2014) reports that 111 countries have laws meant to protect non-smokers from SHS, Drope (2011) in his analysis of tobacco control efforts in Africa notes that whilst the laws have been developed they are yet to be implemented or enforced in earnest. WHO (2015) suggests that for tobacco control legislation to succeed there is a serious need for effective implementation, enforcement and compliance mechanisms, supported by financial and technical resources. The legislation would need to be coupled with strong and continued political commitment, educational and awareness raising strategies throughout the life of the legislation.

Senegal enacted very progressive tobacco control law in the 1980s but within 5years some sections were heavily watered down and others repealed due to pressure from tobacco industry and media house owners (Drope, 2011). The country adopted new comprehensive tobacco control legislation sometime between 2012 and 2014 but the problem of lack of support for tobacco control activities from legislators still persists (WHO, 2014). Similarly,

other African countries such as Burkina Faso, Tanzania and Zambia, according to Drope (2011) have existing national tobacco control legislation but enforcement has been mostly non-existent. Kenya also has national tobacco control legislation but John (2013) noted that there was a lack of human and financial resources to effectively implement tobacco control legislation there.

According to Lambert and Donley (2013), South Africa is one of the countries with best practices on prevention of SHS exposure to non-smokers. The country has combined enforcement of their tobacco control legislation with health inspections conducted by Environmental Health Officers. This system seems to be a panacea to the problem of human resources that was cited in John (2013) as being a challenge to enforcement. WHO (2013) suggests that SHS enforcement can be integrated into existing compliance inspections such as business licensing, health and sanitation, workplace health and safety, fire safety or similar inspections ordinarily conducted by central and local government inspectors. This will do away with the need for an additional pool of inspectors to deal with tobacco control and thus in the process making tobacco control affordable.

In Zimbabwe, police officers have the responsibility of implementing all pieces of enacted legislation which includes the Tobacco Control regulations. The central and local governments employ Environmental Health Officers who are also authorised to enforce tobacco control laws as what, according to Lambert and Donley (2013), is happening in South Africa. Despite the presence of the law enforcement agents, experience has shown active smokers indifferently smoking in designated public places in Bulawayo without regard to non-smokers and as if no legislation against such exists. Unfortunately, at present, there are no studies that have sought to reveal the extent of such public smoking activities. Admittedly, such data is required to help the government in the formulation of its public health programmes. Furthermore, the extent that this lackadaisical enforcement of the tobacco control legislation has caused on the prevalence of SHS among the Bulawayo population is not known. A study to provide this vital data on the extent of second hand smoking among adults in Bulawayo and to understand the underlying factors that drive this practice of second hand smoking is needed.

2.5 PREVALENCE OF SECOND HAND SMOKE EXPOSURE

SHS is widespread, occurring in virtually all places where non-smokers spend time in the presence of smokers; at home, workplaces, in bars, restaurants, public buildings, hospitals, public transport and educational institutions (Wipfli & Samet, 2011; IARC, 2004). If SHS is everywhere it is important that public health officials know the prevalence and associated

factors so that appropriate health interventions can be initiated and implemented. The IARC (2004) report raises awareness on the need for the constant evaluation of SHS prevalence especially in major cities where there is often the problem of overcrowding. Bulawayo, the second largest city in Zimbabwe, is certainly one of such cities where SHS prevalence should be constantly evaluated.

2.5.1 Methodology used in SHS prevalence studies

A number of studies such as the GYTS, GATS and numerous others, have sought to establish the prevalence of SHS exposure. The Global Youth Tobacco Surveys (GYTS) represents the most comprehensive data on tobacco use among youths and always reports data on SHS exposure among children. GYTS is a school-based survey of children aged between 13 years and 15 years in a defined geographic site and it uses a standardized methodology for constructing sampling frames, selecting schools and classes, preparing questionnaires, conducting field procedures, and processing data (CDC, 2008; Oberg, et al 2011). The GYTS sample design produces representative, independent, cross-sectional estimates for each sampling frame (CDC, 2008). Due to standardized study methodology, the GYTS has an advantage in that it makes it easy to compare data from one area to another. Data from the GYTS has been used to report tobacco use and exposure broadly amongst children though the survey subjects are only drawn from the 13-15 years age group. The survey, however, does not seek to report factors correlated with the reported prevalence which would otherwise provide vital detailed information that can aid policy makers in crafting appropriate tobacco control laws. It reports data on 13-15 years only despite the possibility that there will be variations in SHS exposure, perhaps from youths aged 6-9 years to those aged 13-15, to those aged 16-19, and no rationale for specific use of the 13-15 age group was provided in CDC (2008). Notwithstanding this, the data from the survey by its intent and design cannot be used for adult population.

IARC (2004) noted that there was generally a scarcity of data on adult SHS prevalence. In 2007, Global Adult Tobacco Survey (GATS) was initiated to fill in the data gap for measuring adult tobacco use globally. This paucity of adult SHS data still exist today since researchers seem to focus more on youths, probably because youths are associated with lots of developmental and circumstantial dangers such as SHS. More than 140 countries have conducted GYTS whereas GATS has been established in only 16 countries (CDC, 2008; WHO, 2015). In Africa, the scarcity of data on SHS is severe as a search conducted in the internet did not yield a lot of SHS exposure prevalence studies conducted in Africa. The few

prominent adult SHS exposure prevalence were the GATS conducted in Egypt, Kenya, Nigeria and Uganda.

The Global Adult Tobacco Survey (GATS) is a nationally representative household survey that was launched in February 2007 to help countries in the formulation, tracking and implementation of effective tobacco control interventions (WHO, 2015). GATS uses a standardised questionnaire, sample design, data collection, and management procedures though there might be slight variations from one implementing country to another. This household survey of non-institutionalised persons 15 years of age and older employs a multi-stage, geographically clustered sample design to produce nationally representative data. A questionnaire is used to solicit for information on various tobacco control items including SHS exposure.

The GATS and a number of studies such as the Arkansas SHS survey have sought to capture and report SHS episodes that occurred within the last preceding 30 days of the survey. This sounds plausible as a 30 day period is able to capture typical SHS exposure unlike a shorter period. Asking respondents to relate SHS exposure episodes that occurred over a shorter period might present challenges in situations where the respondent had faced an atypical week. Admittedly, a longer period also presents recall challenges where a respondent might not be able to recall all the SHS episodes that occurred in the last 30 days especially if the episodes were infrequent. Balancing the disadvantages of the longer period (30 days) versus the shorter period (7 days) it would seem that the longer period is a better alternative when trying to capture SHS episodes. A 30 day period is likely to capture the typical exposure patterns of an individual. Furthermore, considering that there is likely to be repeat SHS exposure episodes during a long period, the probability for SHS recall episodes is therefore high.

Oberg et al (2011) reports that 33% of males and 35% of females worldwide were exposed to SHS in 2004. The proportion of people exposed to SHS varied from one continent to another. The highest proportions exposed were estimated in Europe (Region C which includes countries such as Belarus, Estonia, Hungary, Russia, Ukraine) where 66% of the population was exposed to SHS and the Western Pacific as well as in Southeast Asia (region B), with more than 50% of some population groups exposed. Proportion of people exposed was lower in the Americas, eastern Mediterranean regions and Africa. Africa (region E) which is mostly composed of Southern African countries had the lowest exposure proportions where only 4% and 9% of males and females respectively were exposed to SHS.

The Global Youth Tobacco Survey (GYTS) conducted in 140 member countries from 2000-2007 revealed that 42.5% of school pupils were exposed to SHS at home whilst 55.1% were exposed to SHS in public places. Exposure to SHS in the home was highest in the WHO European Region at 77.8% and lowest in the WHO African Region at 27.6%. Similar SHS exposure trends were observed in exposure to SHS in public places where the WHO European Region had the highest exposure (86.1%) and the African Region had the lowest exposure of 43.7% (CDC, 2008). The data from the report suggests that most of the exposure occurs in public places than at home.

Questionnaires and biomarkers have been used in SHS prevalence studies and most studies (Abdullah, Driezen, Sansone, Nargis, Hussain, Quah & Fong, 2014; Moore, Moore, Littlecote, Ahmed, Lewis, Sulley, Jones & Holliday, 2015; Pereira, Moraise-Almeidab, Sousab, Jacinto, Azevedo, Robalo, Cordeiro, de Almeida & Fonseca, 2013) have tended to report SHS prevalence for the whole or particular country and for the different settings such as home, public transportation, health care institutions to mention a few. Other studies have, besides reporting on prevalence also reported on the correlates of SHS exposure. In establishing correlates to SHS exposure a number of studies (Bolte & Fromme 2008; Braverman, Aaro & Hetland, 2008; Fischer, Minnweg, Kaneider, Kraemer & Khan 2015; Longman & Passey, 2013; Pereira et al, 2013) have utilised multivariate logistic regression analysis which is indeed appropriate and suitable in identifying the correlated factors.

2.5.2 Second hand smoke exposure prevalence in different settings

Prevalence of SHS exposure will vary from one setting to another. Prevalence rates have been reported for settings such as the home, workplace, educational institutions, health institutions, restaurants, public transportation, to mention but a few.

Home

WHO (2009a) suggests that the home is the single most important setting because that is where the bulk of SHS exposure occurs. According to the CDC (2010) nearly all non-smokers who live with someone who smokes inside their home are exposed to SHS. This assertion is shared by the WHO (2010b) that also indicated that the number of smokers in a household is an indicator of SHS prevalence. Surely, this assertion holds true when you realise that SHS is able to permeate from where a smoking household members is to where non-smokers will be and that toxic chemicals from SHS contamination persist well beyond the period of active smoking, and then cling to rugs, curtains, clothes, food, furniture and

other materials. These toxins can remain in a room weeks and months after someone has smoked there (WHO, 2009a).

According to the Homa, Neff, King, Caraballo, Bunnell, Babb, Garrett, Sosnoff and Wang, (2015) prevalence of SHS exposure in non-smoking population aged 3 years and above in USA was 25.3% during 2011-2012, a reduction from 52.5% in 1999-2000. The prevalence was established from self-reported behaviour and serum cotinine analysis. The report despite not giving the prevalence of key settings such as the home, provides invaluable information on SHS exposure prevalence in USA.

In India, Egypt and Nigeria 52%, 45.6%, 4.6% of non-smokers respectively were exposed to SHS at home during the last 30 days preceding the surveys (India, 2010; Nigeria, 2012; WHO, 2010c). The mentioned studies utilised the GATS methodology. Other studies conducted outside the GATS have also reported high prevalence of SHS exposure within homes. In a cross sectional study conducted in Portugal, 26.6% of the participants reported SHS exposure at home (Pereira et al, 2013). The study was a population based telephone survey where informed consent was given orally. The study concluded that the prevalence of SHS in homes was higher than previously reported though it did not state the possible reasons for the rise in the reported SHS prevalence. Another cross sectional study conducted in 6 counties in China indicates that the home SHS exposure was 48.3% (Wang et al, 2009). Moore et al (2015) suggest that the challenge with the home setting is that it remains largely unregulated. They argue that seeking to control tobacco use in private homes can be viewed as an invasion of people's privacy and might be misplaced in most societies that claim to be democratic. Pereira et al (2013) suggests that there is uncertainty on the effect of public smoking bans on tobacco smoke prevalence in the home. One school of thought is that when people are compelled by law not to smoke in public spaces they will go on to smoke behind closed doors in their homes thus increasing prevalence of SHS exposure prevalence in home. This school of thought is echoed in Callinan et al (2010) who after a review of more than 30 studies on SHS exposure reported that there was no change in either the prevalence or duration of reported exposure to SHS in the home as a result of implementing legislative bans in most areas reported in those studies.

All the above-mentioned studies and discussions echo the importance of noting the SHS exposure prevalence within home. The studies have reported differing exposure prevalence rates in different geographical areas and this reflects the need to carry out research for the area that one desires to get a closer indication of SHS for. Unfortunately, there are no studies on the prevalence of SHS exposure within homes in Bulawayo. The closest that is

there is the GYTS that revealed that 22.6% of youths lived in homes where people smoked in their presence (Biomedical Research and Training Institute, 2008). Reports on how adults were exposed to SHS were missing thus the need to carry out this present study.

Workplace

The workplace is another setting where a lot of SHS exposure occurs since employed people spend most of their productive time at work. A number of studies have reported SHS exposure in workplaces. A SHS survey conducted in Arkansas, United States of America established that 10% of all adult had been exposed to SHS at work in the last 30 days preceding the survey (Ali, 2011). Studies done elsewhere reported SHS exposure prevalence above 10%. In Bangladesh 75.7% of non-smoking adults were exposed to SHS at the workplace in the preceding 30 days before the survey. In Egypt, Kenya and Nigeria 58.5%, 17.6% and 16.2%, of non-smokers adults respectively were exposed to SHS at the workplace (Kenya, 2014;Nigeria, 2012; WHO, 2010c).

Health care institutions

Health care institutions are meant to be where people get help on their sicknesses but a number of studies have reported SHS exposure in hospitals. The legislation in Zimbabwe prohibits tobacco smoking within health care institution premises but in Egypt 49.2% respondents reported to having been exposed to SHS in the hospital within the last 30 days preceding the survey (WHO, 2010c). In Bangladesh, India and Nigeria prevalence of SHS exposure in the preceding last 30 days ranged between 5-6% (India, 2010; Nigeria, 2012; WHO, 2009b). In Bulawayo there are no studies that indicated the prevalence of SHS exposure in health care settings. Given that the legislation prohibits smoking in health care settings, it would be vital to establish how many people are exposed to the deadly SHS in those places which are meant to be places of safety.

Public Transportation

A number of people use the public transportation system on a daily basis and hence this is one of the crucial settings that need to be investigated. Smoking in public transport is prohibited by law in Zimbabwe, yet SHS exposure seems to be common in Africa. In Egypt 70% of the population was exposed to SHS within public transport whereas in Uganda 7.8% and in Nigeria 4.6% of non-smokers were exposed (WHO, 2010c; Uganda, 2013; Nigeria, 2012). In Zimbabwe and Bulawayo in particular, the percentage of non-smokers exposed to SHS within public transportation was unknown.

Restaurants

Restaurants are another source of exposure for non-smokers. In Bangladesh, 55.4% of non-smokers who went to restaurants were exposed to SHS whereas in Nigeria and Kenya 27.6% and 21.2% of non-smokers were exposed. Whilst in some countries such as Zimbabwe legislation has created smoking zones within restaurants, research has established that non-smokers are in actual fact affected by tobacco smoke that permeates from the smoking zone to the non-smoking zone (Lambert & Donley, 2013; WHO, 2013).

Educational premises

Educational premises are one of the places where tobacco smoking is restricted. Tobacco smoking within educational premises helps to ensure that school pupils are not initiated into tobacco smoking after seeing people they regard as role models smoking. Furthermore, the restrictions are meant to protect children from exposure to SHS. According to Kenya (2014) 30.2% of adults were exposed to SHS in universities whereas in Nigeria 7.7% of non-smokers were exposed to SHS in educational facilities. In Zimbabwe, tobacco control legislation prohibits smoking within educational premises and because the focus has been on protecting children, it is not known how many adults who work or visit schools in Bulawayo are exposed to SHS.

2.5.3 Second hand smoke exposure and gender

Males and females have traditionally had different roles in given different settings and these differences affect how males and females interact with certain circumstances. According to Morrow and Barraclough (2010) gender is a key determinant of tobacco use and consequently SHS exposure. This assertion by Morrow and Barraclough (2010) is worthy of notice.

Women are generally the most exposed to SHS within the home setting which is the predominant location for smoking through the smoking of male family workers (WHO, 2009a). For instance, in Indonesia, 75% of non-smoking adult women were exposed to SHS compared to 62% of men at home, whereas in Nigeria 5.4% of non-smoking adult women were exposed to SHS compared to 3.7% of men at home (Nigeria, 2012; WHO, 2012). In Fischer et al (2015) it is reported that 46.7% of the women in the Asian country of Bangladesh were exposed to SHS at home in 2011. Wang et al (2009) in their study conducted in China established through a multivariate logistic regression analysis that there

was a significant association between high SHS exposure and being female. In Africa, Asia and Pacific region women are more exposed at home because of tobacco smokers who are mainly male family members (Shafey, Eriksen, Ross & Mackay, 2009). This is collaborated by Gharaibeh, Haddad, Alzyoud, El-Shahawy, Baker and Umlauf (2011) who suggest that authoritarian culture and male dominated family structures where males take precedence over women in shaping the social practices at home might be responsible for the higher SHS exposure rate among women.

Conscious of the SHS burden faced by women, Wipfli & Samet (2011) suggest that gender-sensitive health education programmes are needed and that women need to be encouraged to engage with all aspects of tobacco control efforts at the local and global levels to ensure that their perspectives and rights are embodied into the tobacco control efforts. Abdullah et al (2014), Gharaibeh et al (2011) and Wipfli & Samet (2011) argue that empowering women to take a more active leadership role in protecting their health and that of their families can facilitate reduction of SHS exposure at the household level. On the other hand, Morrow and Barraclough (2010) caution against forgetting males in tobacco control activities. They argue that tobacco control activities can only be strengthened and made successful by incorporating males as well.

In Brazil, Indonesia and Nigeria in settings such as the workplace, restaurants and transport females have generally been reported to be less exposed to SHS than males (Instituto Nacional de Cancer Brasil, 2010; Nigeria, 2012; WHO, 2012). The above cited studies only reported the figures indicating that women were less exposed to SHS and not the reasons for this scenario. It is, however, probable that this scenario could be ascribed to the fact that unlike the home setting, women can exercise their freedom in choosing whom they associate with in these other settings hence might be able to shun smokers in these settings. The other reason could be that women are protected from exposure by legislation that has designated settings such as workplaces, restaurants and transport as being smoke-free areas.

2.5.4 Second hand smoke exposure and age

Second hand exposure will vary among the different age groups in different settings. Pereira et al (2013) reported that being aged 65 years or older compared to being 18–64 years, decreased the odds of being exposed to SHS. Studies done in Bangladeshi and in Nigeria are in agreement with Pereira et al (2013) that being aged 65 and more reduces chances of exposure to SHS (Nigeria, 2012; WHO, 2009b). Abdullah et al (2014) reports that in

Bangladesh youths aged 15-24 (51.3%) were more exposed to SHS at home than those older yet in a study done in India, younger persons (age 15-24) were found to be less exposed to SHS at the workplace when compared to other age groups (India, 2010). What is perhaps being reflected more clearly by the cited studies is that different age groups are exposed differently to SHS. This reflection is particularly important in Bulawayo where the only data that is available is that of 13-15 year olds obtained during the GYTS. The cited studies point to the need to conduct a study specifically on adults and the futility of any attempt to extrapolate information from the Bulawayo GYTS information.

2.5.5 Second hand smoke exposure and socio-economic status

Socio-economic status (SES) has been shown to be associated with SHS exposure and WHO in its 2014 global report on implementation of tobacco control policies reported that only 42% of the parties to the WHO FCTC took into account socio-economic status in their tobacco control programmes. Orton, Jones, Cooper, Lewis, Coleman (2014) in a systematic review of forty-one studies conducted in different countries noted that children of parents with low socioeconomic status were up to three times more likely to be exposed to SHS, with the odds ratios (OR) from individual studies ranging from 1.1 to 3.3. This assertion seems to be also shared by Longman and Passey (2013) who state that low socioeconomic status is one of the main drivers of children's SHS exposure at home.

Homa et al (2015) concluded that in USA persons living in poverty still experienced high SHS exposure rates despite a marked SHS exposure decline in the general population. In Bangladesh, 81.9% of non-smoking adult workers in the lowest socio-economic status category were more exposed to SHS in indoor workplaces than those in highest socio-economic status category where 73.2% were exposed. In restaurants, 47.8% of non-smoking adults in the lowest socio-economic status level were exposed to SHS compared to 64.2% in the highest socio-economic status level (WHO, 2009b). Even within the same setting, prevalence of SHS exposure can vary depending on socio-economic status differences amongst the exposed persons.

The association between low socio-economic status and high SHS exposure has been proven in a number of studies (Homa et al, 2015; Longman & Passey, 2013; Orton et al, 2014; WHO, 2009b). Be that as it may, a study seeking to provide a snapshot of SHS knowledge, attitudes, and avoidance behaviors regarding SHS exposure among educated Jordanian women seems to call this commonly held belief into question. The results of that

study were generated using a convenience sample of women working at two Jordanian universities and the main rationale for choosing this sector of the population, according to Gharaibeh et al (2011), was to test the common belief that educated working women experience less SHS exposure than women with poor education or lower socio-economic status. The study established that almost two thirds (59.6%) of subjects were exposed to SHS at their homes. Furthermore, almost half (48.8%) of the women were ignorant of the anti-smoking policies that their institutions had. Gharaibeh et al (2011) seem to suggest that even amongst those of high education and socio-economic status there is high exposure and inadequate knowledge on SHS. Whilst, Gharaibeh et al (2011) view on the association between socio-economic status and SHS exposure is appreciated, the methodology particularly convenience sampling, employed in the study is not compelling for one to accept their assertion as being plausible enough.

2.5.6 Second hand smoke exposure and educational attainment

Educational attainment is another factor that has an effect on prevalence of SHS in a given setting and group of people. In Homa et al (2015) serum cotinine levels from participants revealed that those with low educational attainment were most exposed to SHS at 27.6% and those with high educational attainment had lower prevalence of SHS exposure at 11.8%. According to WHO (2012), in Indonesia adult non-smokers with the highest educational level (college and university level) had the lowest exposure to SHS at home (49.2%) as compared to the people with less than primary level (78.1%). An almost identical trend was observed in Nigeria where 1.7% of adult non-smokers with a post-secondary/ high school education; 5.0% non-smokers with primary school or less and 4.1% for those with no education were exposed to SHS at home. At the workplace setting non-smoking adults with no education had a highest exposure to SHS and those with post-secondary education had the lowest SHS exposure (Nigeria, 2012). A comparison of the reported exposure rates for those with primary education and less in Indonesia (78.1%) and Nigeria (<10%) shows that there is a vast difference in the reported prevalence in these geographically different places. These wide differences suggest that, if the prevalence of SHS exposure in Bulawayo has to be understood as it is, there is need for a study to be conducted in Bulawayo as extrapolating the data from a different geographical location is prone to serious under or over estimation.

2.5.7 Second hand smoke exposure and religion

Religion is a powerful factor in many people's lives. It influences the behaviour and perceptions of its adherents. It seems logical to postulate that religion affects how people are

exposed to SHS. This logical postulation is reinforced by Fischer et al (2015) who in their study carried out in Bangladesh concluded that being Islamic compared to other religious affiliations was a protective factor against SHS exposure. In Zimbabwe, there are religious groups such as the Seventh-day Adventists that also discourage their members from smoking and like Islamism, being a member of such similar groups can be a protective factor against SHS exposure (General Conference of the Seventh-day Adventist, 2010). The importance of religion in tobacco control activities is further reflected in GATS which asks the questions- “During the past 30 days, did you visit any religious facilities?” and “As far as you know, does your religion discourage smoking?” (WHO, 2012:141; Nigeria, 2012:150). Despite, asking the question on religion, no association between SHS and religion was made in most GATS reports.

2.5.8 Second hand smoke exposure and media

The media is another important factor in as far as prevalence of SHS exposure is concerned. According to the WHO (2013), raising awareness among the public and opinion leaders about the risks of second-hand tobacco smoke exposure through ongoing information campaigns is important to ensure that the public understands and supports legislative action. The media can play a special role in this regard. This is collaborated by Tam and van Walbeek (2013) who state that the media can serve an important role in promoting tobacco control legislation by functioning as government ‘watchdogs’, highlighting tobacco control challenges and by portraying tobacco control in a positive light. A media campaign carried out in Australia (New South Wales) in 2005 to increase awareness among parents and caregivers of the health effects of SHS on children resulted in a 26% percentage point increase in smoke-free homes to 73% compared from 46.9% baseline (Kosir & Gutierrez, 2009)

2.5.9 Knowledge, enforcement and attitudinal factors

A person’s knowledge on health effects of SHS as well as their attitude has an influence on SHS exposure. The ITC Project, WHO and World Heart Federation (2012) reports that non-smokers who did not believe or know that SHS exposure could cause heart diseases ranged from 88% in Vietnam to 5% in Thailand and suggest that poor knowledge contributes to the perpetuation of tobacco’s adverse effects. These concerns of the ITC Project, WHO and World Health Federation (2012) are substantiated by Gharaibeh et al (2011) who state that the likelihood of exposure can be compounded when people are not aware of the dangers of exposure, or the adverse health consequences of SHS exposure. On the other hand, Abdullah et al (2014) suggests that knowledge and attitudinal factors might not be the best of

SHS exposure predictors. They analysed the relationship of 11 knowledge and attitudinal measures with SHS exposure and only three exhibited a significant relationship. The report by Abdullah et al (2014) leads one to deduce that there could be factors that have a more bearing on SHS exposure than knowledge and attitude towards tobacco control.

2.6 CONCLUSION

This chapter has shown that there are great variations in SHS exposure from one geographic area to another and from one setting to another. The variations clearly pointed to a need to conduct a specific study for Bulawayo as this was going to give an assurance of study findings reflective of the Bulawayo context. The chapter has also highlighted a number of factors that can have a bearing on SHS exposure. The next chapter looks at the methodology that was employed in conducting this study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

Research methodology is a scientific and systematic way to solve research problems. It deals with the research methods and takes into consideration the logic behind the methods that are used in research (Bhattacharyya, 2013). The previous chapter discussed SHS literature and in this chapter the focus will be on the scientific method and systematic way that was used to solve the study's research problem. The discussion will be centred around the study design, population size and sample size as well as on reliability and validity. The pre-test that was conducted before the main study will also be discussed here.

3.2 STUDY DESIGN

The study design is primarily concerned with finding answers to research questions (Lee & Lings, 2008) hence an appropriate design for the research question had to be identified in order to answer the research question posed at the beginning of this study.

Cross-sectional studies, as noted by Lee and Lings (2008) are used to collect data on far more variables at a single point in time and they allow, according to Creswell (2009) for variables to be quantitatively measured and statistically analysed. Furthermore, the review of literature revealed that the cross sectional study design had been used in several similar studies on SHS prevalence (Ali, 2011; Haw & Gruer, 2007; Wang et al, 2009). In this study a cross-sectional study design was employed as the objective was to provide a snapshot of the existing prevalence of SHS exposure among the adult population of Bulawayo. Data was collected over a period of six weeks.

3.3 STUDY SITE

The research was conducted in Bulawayo, the second largest city in Zimbabwe (Chronicle, 2015; Parliament of Zimbabwe, 2011). This city is located on the south western part of the country, Zimbabwe as shown in Figure 3.1. The city has a lot of public places such as bus termini, flea market, stadia, restaurants to name but a few where people congregate for commercial and social functions. Like most urban centres in the country, this city has been influenced by the western culture and western practices such as cigarette smoking and eating out are very common.



Figure 3.1 Map showing Bulawayo

3.4 STUDY POPULATION

The total population in Bulawayo is 653 337 with 303 346 males and 349 991 females (Zimbabwe National Statistics Agency, 2013). In the last Zimbabwe Demographic and Health Survey (2011) it was reported that in Bulawayo, 18.1% and 0.7% of the male and female population respectively were smokers. Based on these two latest official surveys (Zimbabwe National Census, 2012 and Zimbabwe Demographic and Health Survey, 2011) it was calculated that there were 2 124 female smokers and 347 867 female non-smokers. There were 54 906 male smokers and 248 440 male non-smokers in Bulawayo. The total population of non-smokers in Bulawayo stood at 596 307 and this was the population of interest in this study.

The ideal situation would be to survey the entire population if one desired to know the actual values of parameters of interest in a given community. However, is not always feasible due to cost, time, labour and other constraints (Bhattachryya, 2013). In this study, the constraints similar to those reported in Bhattachryya (2013) were noted and a representative sample of the Bulawayo population had to be used.

In order to ensure that the sample was going to be representative enough to allow generalisation about the Bulawayo population the sample size was statistically calculated using the following formula:

$$N = z * z \left[\frac{P(1 - P)}{e^2} \right]$$

Where:

N= sample size

Z= z-score for given confidence level

P= expected proportion of cases

e= margin of error

The confidence level that was desired in this study was 95%, the margin of error was 5% and expected case proportion was 50%. A proportion of 50% expected cases was chosen as according to Israeli (2013), it indicates the maximum variability in a population. Israel (2013) further states that, the proportion of 50% is often used in determining a more conservative sample size and suggests that the resultant sample size may be larger than if the true variability of the population attributes were used.

Given the above, the sample size for this study was calculated to be 384. According to Leedy and Ormrod (2014), a population above 100 000 requires a sample size of 384. The calculation of the sample size for this study was, therefore, consistent with what is suggested in Leedy and Ormrod (2014). However, an additional 10% was added on the calculated sample to ensure that no less than the required 384 questionnaires would remain after discounting for non-responses and questionnaires that could have been rendered unusable in any way.

A total of 423 respondents were therefore sampled for this study.

3.5 SAMPLING

The City of Bulawayo was divided into 13 primary sampling units according to the distribution of the municipal housing offices within the city. These housing offices were public and central places normally visited by adult residents. One revenue hall was located in the

Central Business District and the other 12 housing office/revenue hall were spread across the residential areas of the city.

The proposed plan was to visit each housing office/revenue hall thrice. However, after discussions with the officials responsible for the sites it was agreed that it would be best to visit each site once and a program to visit each of these 13 housing offices/revenue halls once was drawn. The program was shared with the senior managers responsible for the housing offices/revenue halls who were to circulate the program to those sites. The researcher also made contact with the housing offices a day before the scheduled visit to confirm if the local official in charge at that site was aware of the study and the data collection visit.

In the 12 housing offices in the suburban areas there were basically no queues and every third individual who entered the housing/revenue hall was sampled. However, in the revenue hall at the Central Business District a long queue was found and every third individual on the queue was sampled. The researcher greeted every sampled resident, explained the purpose of the study. Residents were informed that the study was for Bulawayo residents only before being politely asked whether they were current smokers or not and whether they were aged 18 and above or not. Those who responded that they were non-smoking adults resident in Bulawayo were then invited to be part of the study. If the one sampled declined, the invitation was extended to the next person. All those who accepted were first given the consent forms and the questionnaires thereafter.

Similarly to what was observed during the pretest, it was noted that a bulk of the respondents (96%) were content with giving a verbal consent to take part. Despite being assured of the purpose and use of the consent forms, respondents were not content with writing their names on the consent form. This perhaps could be ascribed to the local cultural and socio-political environment where people prefer to remain anonymous and not to disclose their personal details to strangers.

3.6 INCLUSION AND EXCLUSION CRITERIA

3.6.1 Inclusion Criteria

All non-smoking Bulawayo residents aged 18 and above were eligible to be part of this study. Non-smoking residents were deemed to be those who did not intentionally smoke tobacco or those who had quit intentional tobacco smoking.

3.6.2 Exclusion Criteria

Tobacco smoking residents, residents aged below 18 and people who were ordinarily not resident in Bulawayo were excluded from this study. Tobacco smokers were deemed to be those who intentionally smoked tobacco daily or occasionally or anyone who considered himself or herself an active tobacco smoker.

3.7 DATA COLLECTION

3.7.1 Data Collection Method

A questionnaire, pen and clipboard were given to each participant sampled. The questionnaire given to the participants was either in English or Ndebele depending on the participant's preference. In the suburban housing offices there were benches within the housing hall and a bench was arranged where participants were requested to sit whilst completing the questionnaire. At the revenue hall in town a questionnaire, pen and clipboard were given to the sampled participants whilst they were standing in the queue. In all cases the questionnaires were immediately collected by the research assistants from each participant on completion. Two Research Assistants assisted the Researcher in distribution and collection of questionnaires.

A total of 419 out of 423 distributed questionnaires were received back from the participants giving a response rate of 99%. The 4 participants who did not return their questionnaires were lost to the researcher and research assistants at the revenue hall in town. It was thought that since the queue was long the participants gave up on the queue and went away with the questionnaires.

3.7.2 Data Collection Instrument

Data was collected using a self-administered structured questionnaire. The questionnaire was chosen as a data collection instrument because it was consistent with the research design chosen for this study. As Creswell (2009) noted, data collection methods and instrument are part of the research design, it was therefore imperative that the choice of the data collection instrument used was a close fit to the design employed in the study.

Questionnaires were chosen because they are simple and inexpensive (Perez-Rios et al 2012). In addition to that it was noted, as indicated by DePoy and Gitlin (2011) that questionnaires had an advantage of increasing chances of obtaining honest responses, having a large number of people answer questions in a short period as well as providing relatively easier statistical analysis. Perez-Rios et al (2012) reports that questionnaires are

the most commonly used tool to ascertain retrospective and current second hand smoking exposure among the population and that the use of a questionnaire in second hand exposure allows exposure to be distinguished according to source or setting. The observation by Perez-Rios et al (2012) persuaded the researcher that the questionnaire was a data collection instrument of choice in this particular research where the objective was to establish the prevalence of SHS exposure.

The questionnaire was developed by the researcher with some questions being adapted from questionnaires used by Ali (2011) and Biomedical Research and Training Institute (2008). Regulations on tobacco control in Zimbabwe were used to contextualise some questions from the indicated questionnaires and other new questions were added based on literature study and what the Zimbabwean regulations dictated on tobacco control. The questionnaire was so designed that it gave an impression of relaxation and uncluttered ease, the language used was courteous and culturally acceptable. The questions were clear, reasonable and did not make the respondents uncomfortable or seek to infringe on their privacy.

The questionnaire (attached as Appendix A) had 25 items whereas the one used by Ali (2011) in the Arkansas SHS survey had 47 items and the GYTS had only 4 items on SHS exposure. It was deemed that 25 items would be long enough to provide an in-depth view into prevalence of SHS exposure in Bulawayo and yet short enough to be completed with ease by participants. Furthermore, the questionnaire (attached as Appendix B) was translated to isiNdebele by the researcher for those who desired to respond in isiNdebele. The researcher, whose home language is isiNdebele, formally studied isiNdebele up to secondary education level

3.8 DATA ANALYSIS

The data obtained was analysed using SPSS version 22 by the researcher with the assistance of the University of Limpopo statistician. The prevalence of SHS was described according to demographic characteristics such as age, gender, marital status, highest educational level and religious background. Pearson chi-square was used to test significance of association between cross-tabulated items. Multivariate logistic regression analysis was performed to further reveal the underlying relationship between home second hand smoke exposure and the following factors: knowledge on SHS, knowledge on tobacco control legislation, seeing anyone being arrested for smoking in public, attitude towards tobacco control, health education influence, and media influence.

In trying to understand more on this phenomenon, second hand exposure at home was deemed to be a dependent variable and was defined as living with one or more tobacco smokers at home. The factors mentioned previously were deemed to be the independent variables. The dependent variable was operationalised as a dichotomous variable and coded as zero for “Not exposed to SHS at home” and as one for “Exposed to SHS at home”.

Questions 15, 16 and 17 were reformulated into an independent variable “Knowledge of SHS health effects”. Correctly answering the 3 questions in the affirmative was taken as good knowledge whereas incorrectly answering any of the three questions was taken as inadequate knowledge.

Questions 18 and 19 were reformulated to give knowledge of tobacco control legislation. Correctly responding to these questions was taken as good knowledge whereas incorrectly responding to any of the two questions was taken as inadequate knowledge.

Seeing anyone being arrested was another independent variable and it was reformulated out of question 20.

Attitude towards tobacco control was another independent variable and was created out of question 21 and 22. Responding in the affirmative to question 21 and selecting fourth option in question 22 was taken to be a positive attitude. Any other response was taken to be negative attitude.

Active health education influence was deemed to having heard a health worker giving lesson of SHS or having seen health posters or messages in a period of four weeks or less. Having heard or seen health education materials or lessons was deemed to be inactive health education influence.

The sixth independent variable that was used in multiple regression analysis was ‘media influence’. Having seen an article in the newspaper in the last four weeks was seen as an active media influence and having seen it in a period more than four weeks was taken as inactive media influence.

3.9 INSTRUMENT VALIDITY AND RELIABILITY

3.9.1 Validity

The validity of an instrument is the extent to which the instrument measures what it is intended to measure (Leedy & Ormrod, 2014). In order to improve validity of this study, the protocol was submitted, before commencement of the study, to the University of Limpopo

Higher Degrees Committee to review it and establish if research questions were sufficiently addressed by the items on the questionnaire. A pre-test was also conducted at Esigodini, a town 40km from the study site, in a bid to improve validity of the study.

3.9.2 Reliability

Reliability refers to ability of the data collection instrument to give consistent or same results under conditions that are comparable (Leedy & Ormrod 2014). To improve reliability of this study, a pre-test was done in Esigodini, a town 40km away from the study site.

3.10 BIAS

According to DePoy and Gitlin (2011) bias is the potential unintended or unavoidable effect on study outcomes. DePoy and Gitlin (2011) further indicate that when bias is not accounted for the study outcomes could be distorted. In this study to ensure that the outcomes were not distorted by bias, the possible biases were identified and managed before the implementation of the study. It was noted that there was likelihood of selection bias and this bias was minimised by using a random sample.

DePoy and Gitlin (2011) observe that questions that elicit for a socially desirable response introduce bias into a study. To counteract this important observation, non-leading questions were used to avoid information bias that could have been brought in by participants attempting to give researcher expected or socially desirable responses.

3.11 PRE-TEST

The study was pretested in Esigodini, a town that is 40km away from Bulawayo. The pre-test was carried out on thirty-seven (37) Esigodini General Hospital staff and visitors coming to see the sick.

As the researcher was soliciting for respondents what came clear was that the respondents were not willing to fill in their names and signatures on the consent form despite the use and purpose of the consent form being clearly elucidated. Respondents gave reasons why they did not want to fill their names. Others said they were afraid that if they put their names on the consent form that information can be used by their political opponents, others were adamant that there would be no confidentiality in their responses if there was a consent form somewhere that bore their details, others indicated that they could not give their names to a stranger yet still others indicated that they had filled many research questionnaires but none required them to consent in writing. Almost all (95%) the respondents were happy to give verbal consent only. The refusal of the respondents to consent in writing was perhaps

reflective of the general mistrust and polarisation that has been created by the political environment. Admittedly, in Zimbabwe, most researchers do not require written consent forms for non-experimental, non-privacy invasive or non-medical research.

All the questions were generally answered though there was a problem with question 8. Some people who had indicated that they had no smokers at their home went on to answer question 8 which was for those who had indicated that they had one or more smokers at their home. Most of those who incorrectly answered this question had ticked on the 1-31 minutes option indicating that perhaps they thought this was an appropriate option for them since they have zero minutes exposure. In the final questionnaire a clarifying statement was inserted that ***“If there are zero people who smoke in your home kindly skip question 8 and go to question 9”***.

Secondly, a few others complained that there appeared to be repetition in response options and this confused them. Using question 15 as an example, it was phrased as “Smoking is dangerous to human health” and one of the option was “Yes, smoking is dangerous to human health”. To address the concerns, options worded like this were changed and left simple as “Yes” or “No”. Removing the extra words also made the questionnaire appear relaxed and uncluttered.

Thirdly, there was confusion on question 18 and 19. The intent was to see if people knew that according to the laws of the country that are enforceable by the national police people can be arrested for smoking within school grounds and hospitals. However, a number of the participants seemed to understand the question as if it was asking whether it was morally right or wrong to smoke within the ground of these institutions. The questions was adjusted to reflect what the researcher intended. After the adjustments were done, the corrected version was taken and pretested in Nyamandlovu 40km north of Bulawayo and the initial problems appeared to have been resolved.

3.12 ETHICAL CONSIDERATIONS

The study was conducted after ethical clearance had been obtained from the University of Limpopo, Medunsa Research Ethics Committee (MREC). Permission to conduct the study was also sought and given by the City of Bulawayo. The ethical clearance from MREC and the study approval letter from the City of Bulawayo are attached as appendix E and F respectively.

The objectives and purpose of the study as well as issues of confidentiality were explained to all participants. They were advised of their right to withdraw at any stage of the project. An

informed consent form (attached as Appendix C) was administered to all participants and their decision to give verbal or written consent was respected. The informed consent form was translated into isiNdebele and is attached as Appendix D. No physical, spiritual or emotional harm was done to participants. The dignity and autonomy of all participants was observed throughout the conduct of this study.

3.13 CONCLUSION

This chapter provided a scientific and systematic way that was employed to solve the study's research problem. A detailed description of how this study was designed and conducted was provided as well as how data was collected and handled. In the following chapter, results obtained using the delineated methodology will be presented.

CHAPTER 4

RESULTS

4.1 INTRODUCTION

In this chapter results that were obtained in this study are presented and analysed. The results presented herein are in response to the objectives which sought to establish the prevalence of SHS exposure in Bulawayo, Zimbabwe and to further understand the drivers behind the established prevalence rates. As indicated in the previous chapter, data that was obtained from the study was collected using questionnaires and was analysed on SPSS version 22. The results have been presented in simple tables, contingency tables, bar charts and pie charts. Odds, odds ratios, chi-square statistic as well as multivariate regression analysis of the data is presented herein. Demographic data of all respondents who participated in this study will be presented first, thereafter results will be presented under the objective that they sought to respond to.

4.2 DEMOGRAPHIC DATA OF STUDY PARTICIPANTS

4.2.1 Age

A total of 419 participants were involved in this study.

The results (Figure 4.1) indicate that 23.2%(97) of the respondents were aged 18-24; 26.5% (111) were aged 25-34; 17.9% (75) were aged 35-44; 15% (63) were aged 45-54; 13.6% (57) were aged 55-64 and those who were 65 and above were 3.8% (16).

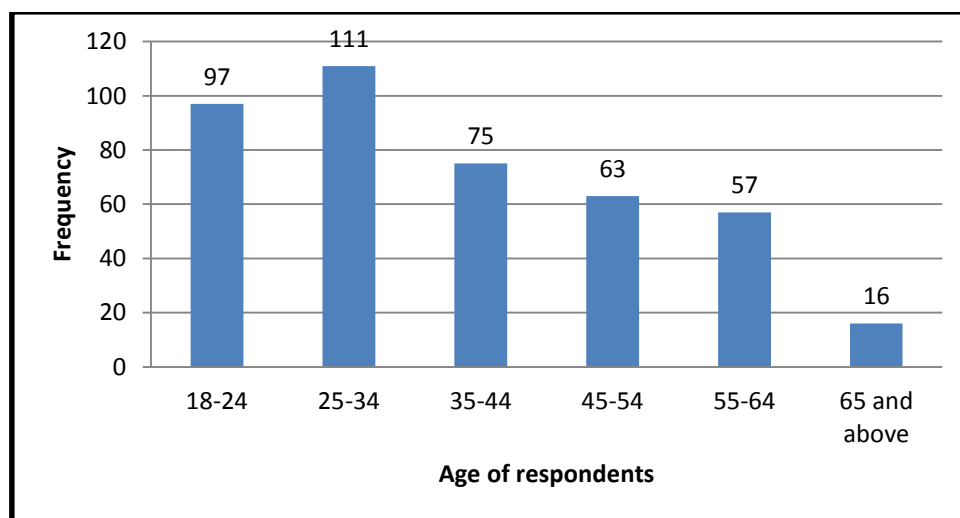
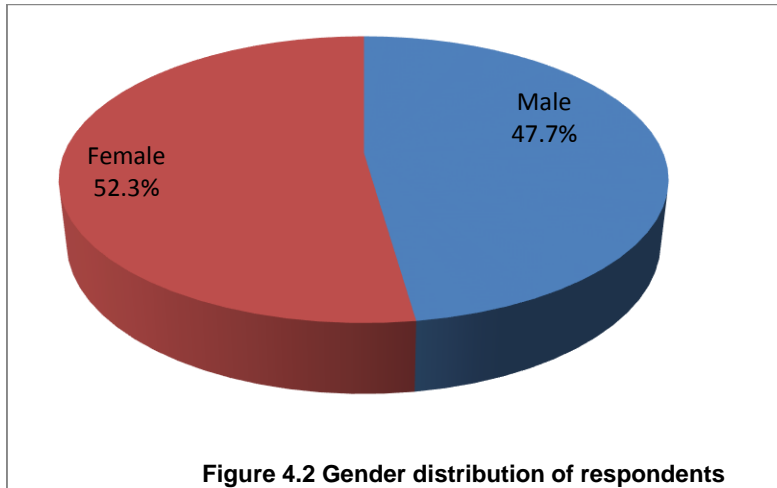


Figure 4.1 Respondents' age

4.2.2 Respondents' Gender

Figure 4.2 shows that 52.3% of the respondents in this study were females whereas 47.7% were males.



4.2.3 Educational Attainment

The study also sought to ascertain the highest educational level attained by the respondents (N=419) and this information is shown in Figure 4.3. The majority (61.3%) of the respondents had attained secondary level education, those that had attained college/university education were 38.7% and only a few (14.3%) had primary level education as their highest education level.

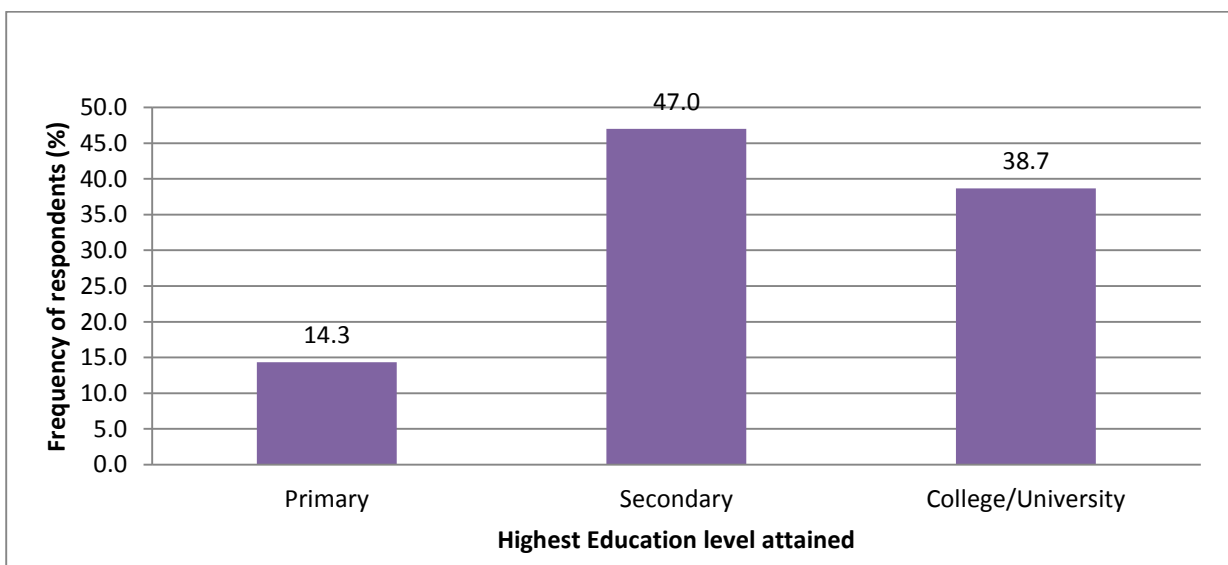


Figure 4.3 Highest educational level attained by respondents

4.2.4 Religion

Religion is an important factor in tobacco control and a question on religion was asked during the study. As shown in Table 4.1, the majority of the respondents (91.1%) reported that they were Christians; traditionalists followed at 4.6%; Muslims were 0.5% and 3.6% of the respondents indicated that they did not have a religion, whereas 0.2% stated that they had another religion not given in the question response options.

Table 4.1 Respondents' religion

Religion	Frequency	Percent
Traditionalist	19	4.6
Christianity	379	91.1
Muslim	2	0.5
Other	1	0.2
I don't have a religion	15	3.6
Total	416	100.0

4.2.5 Marital status

The majority of the respondents (52.2%) were married or living with a partner, whereas 31.8% indicated that they had never been married. Widows and widowers accounted for 9.8% and the least category was for the divorced at 6.2%.

Table 4.2 Marital status of respondents

Marital status	Frequency	Percent
Never married	133	31.8
Married/living with partner	218	52.2
Widowed	41	9.8
Divorced	26	6.2
Total	418	100.0

4.3 OBJECTIVE ONE: TO DETERMINE PREVALENCE OF SECOND HAND SMOKE EXPOSURE AMONG ADULTS IN THE CITY OF BULAWAYO, ZIMBABWE.

4.3.1 Prevalence of second hand smoke exposure at home

The study sought to find out the number of smokers which the respondent lived with and the number of minutes in a day in which those smokers smoked tobacco in their presence (exposure minutes). Table 4.3 shows that 22% (92) of the respondents lived with one or more smokers at home who smoked for more than one minute daily in their presence.

In terms of time exposure, 8% of the respondents had smokers smoking in their presence for a period ranging from 1 to 30 minutes in a day and 6% had smokers exposing them to tobacco smoke for a period of more than 2 hours daily. Amongst those exposed for more than 2 hours daily was one respondent who reportedly lived with 7 smokers.

Table 4.3 Number of exposed respondents by duration and number of smokers at home

		Exposure minutes					Total
		0min	1-30min	31-60min	1-2hrs	>2hrs	
Number of smokers at home	0	327	0	0	0	0	327 (78%)
	1	0	27	8	11	16	62 (15%)
	2	0	3	5	4	4	16 (4%)
	3	0	2	2	3	2	9 (2%)
	4	0	0	0	1	2	3
	5	0	1	0	0	0	1
	7	0	0	0	0	1	1
Total		327 (78%)	33(8%)	15(3.6%)	19(4.5%)	25(6%)	419 (100%)

In summary, 22% of the respondents were exposed to SHS within the home whereas 78% of the respondents were not (Figure 4.3).

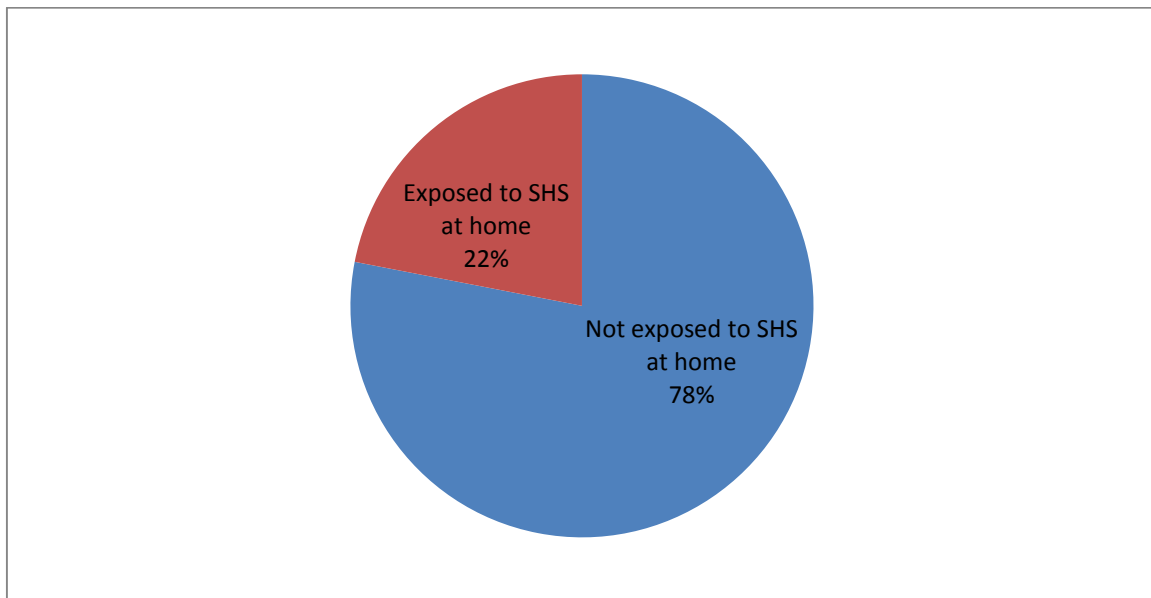


Figure 4.4 SHS exposure at home

Gender

In terms of gender, more females (27.9%) were exposed to SHS at home than males (15.5%) as depicted in Table 4.3. The relationship between the gender of the respondent and exposure was significant with $p=0.002$. Females were 2.1 times more likely than males to be exposed to SHS exposure at home.

Table 4.4 Gender and home SHS exposure

Exposure to Second Hand Smoking (SHS) at home	Gender		Total
	Male	Female	
Not exposed to SHS at home	169	158	327
Exposed to SHS at home	31	61	92
Total	200	219	419
Pearson Chi- Square: value 9.310; df 1; p 0.002			

Age

Age is one important correlate of SHS exposure at home. Table 4.4 shows that there was higher prevalence (26.4%) of SHS exposure among those aged 18-34 and least among those aged 55 and above at 12.3%. There were decreasing odds of exposure to SHS with increasing age. Younger persons (18-34years) were 2.6 times more likely to be exposed to SHS than older persons (>55years) at home.

Table 4.5 Age of respondents and home SHS exposure

		Exposure to SHS at home		Total	% exposed	Odds of exposure
		Not Exposed	Exposed			
Age	18-34	153	55	208	26.4%	0.36
	35-54	110	28	138	20.3%	0.25
	>55	64	9	73	12.3%	0.14
Total		327	92	419		
Pearson Chi-square: Value 6.615; df 2; p 0.037						

Religion, Highest educational level attained and Marital status

Table 4.6 depicts that the majority (91.1%) of the respondents (N=416) were Christians, traditionalists were 4.6% (19), about 3.6% (15) indicated that they had no religion and less than 1% (2) were Muslims. A total of 22% of the Christians who were enrolled in this study and 10.5% of the traditionalists were exposed to SHS at home. The association between religion and SHS exposure at home was however not statistically significant ($p=0.500$). The association between educational attainment and home SHS exposure was not significant ($p=0.387$) as well as that between marital status and home SHS exposure ($p=0.789$). However, for those who had spouses who were smokers, the association between spousal tobacco smoking status and SHS exposure was significant ($p<0.000$). Exposure to SHS was greater (95%) in those married or living with tobacco smoking spouses than those living with spouses who did not smoke (13.5%).

Table 4.6 SHS exposure, religion, highest educational level attained and marital status

	Exposed to SHS at home		Total	Pearson chi-square
	Not exposed to SHS at home	Exposed to SHS at home		
Religion				
Traditionalist	17	2	19	Value: 3.358 df : 4 P : 0.500
Christianity	294	85	379	
Muslim	1	1	2	
Other	1	0	1	
I don't have a religion	13	2	15	
Total	326	90	416	
Highest Educational level				
Primary	49	11	60	Value: 1.049 df : 3 P : 0.387
Secondary	148	49	197	
College/University	130	32	162	
Total	327	92	419	
Marital status				
Never married	100	33	133	Value: 3.358 df : 4 P : 0.500
Married/Living with a Part.	174	44	218	
Widowed	32	9	41	
Divorced	20	6	26	
Total	326	92	418	
Does spouse smoke				
Yes	1	19	20	Value: 73.028 df : 1 P : <0.000
No	173	27	200	
Total	174	46	220	

4.3.2 Prevalence of second hand smoke exposure in public transportation

Figure 4.5 shows that 59.1% of the respondents had not seen or smelled tobacco smoke within the public transportation they were travelling in the last 30 days preceding the study. On the other hand, 40.9% of the respondents reported having smelled tobacco smoke in the public transport they were in.

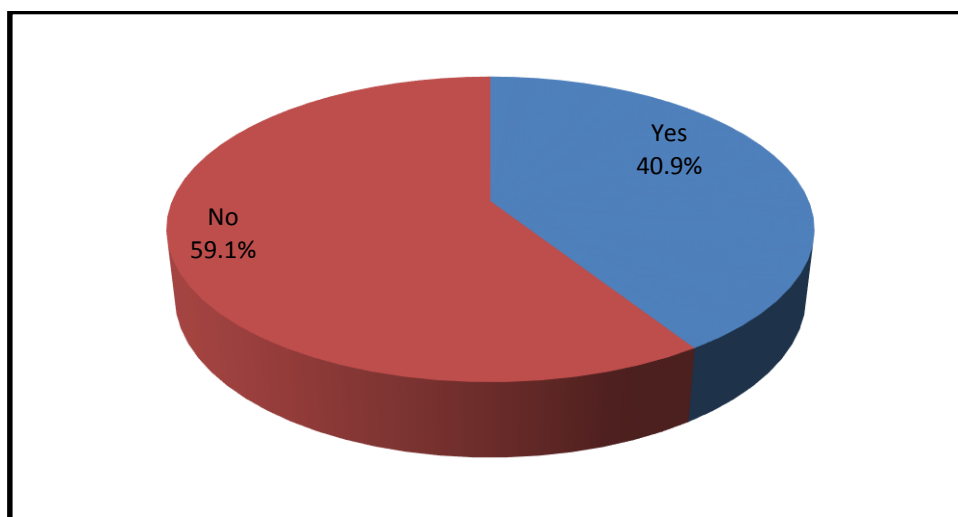


Figure 4.5 Prevalence of SHS in public transportation

Gender

Table 4.7 shows that slightly more males (42.1%) than females (39.8%) were exposed to SHS within public transport. However, according to Pearson chi-square this association between SHS exposure in public transport and gender was not significant.

Table 4.7 Gender and SHS exposure in public transportation

		In the last 30 days did you smell tobacco smoke in the public transport you were in		Total	% exposed to SHS
		Yes	No		
Sex	Male	83	114	197	42.1%
	Female	86	130	216	39.8%
Total		169	244	413	40.9%
Pearson chi-square: value 0.229; df 1; p 0.632					

Age

Exposure to SHS within the public transportation varied amongst the different age groups. It was highest amongst the age group 35-54 years followed by the age group 18-34, with the least exposure to SHS being seen in the age group >55.

Table 4.8 Age and SHS exposure in public transportation

		In the last 30days did you smell tobacco smoke in the public transport you were in		Total	% exposed to SHS
		Yes	No		
Age	18-34	86	120	206	41.7%
	35-54	62	73	135	45.6%
	>55	21	51	72	29.2%
Total		169	244	413	40.9%

4.3.3 Prevalence of second hand smoke exposure in health facilities

A total of 270 respondents indicated they had visited health facilities in the last 30 days prior to the survey. Slightly above a quarter (26.3%) of the respondents reported that they had smelled tobacco smoke within the health facilities they had visited. The majority (73.7%) of the respondents indicated that they had not smelled tobacco smoke in health facilities they had visited.

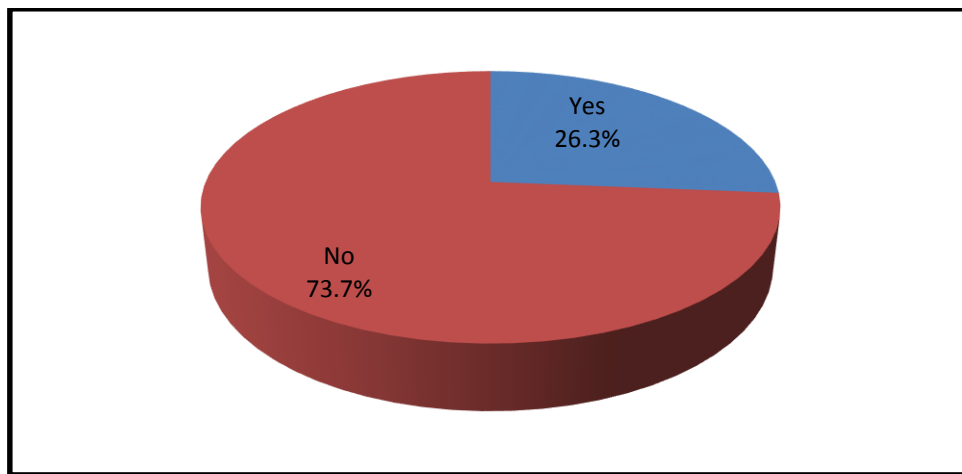


Figure 4.6 Respondents who smelled tobacco smoke within health facilities

Gender

As depicted in Table 4.9 below, more males (28.8%) than females (23.9%) had smelled tobacco smoke within hospital premises in the last 30 days preceding the study. The association between gender and SHS exposure in hospital was however not significant.

Table 4.9 Gender and SHS exposure in hospital

		In the last 30 days did you smell tobacco smoke in a health premises you were in		Total	% exposed to SHS
		Yes	No		
Gender	Male	38	94	132	28.8%
	Female	33	105	138	23.9%
Total		71	199	270	26.3%
Pearson chi-square: value 0.827; df 1; p 0.363					

Age

Table 4.10 below shows that age groups 35-54 and >55 were nearly equally exposed to SHS within health premises. The least exposure (23.9%) was found among the ages 18-34. However, in terms of Pearson chi-square the association between age and smelling tobacco smoke within health premises was not significant.

Table 4.10 Age and SHS exposure in health premises

		In the last 30 days did you smell tobacco smoke in a hospital you were in		Total	% exposed to SHS
		Yes	No		
Age	18-34	32	102	134	23.9%
	35-54	26	64	90	28.9%
	>55	13	33	46	28.3%
Total		71	199	270	26.3%
Pearson chi square: value 0.807; df 2; p= 0.668					

4.3.4 Prevalence of second hand smoke exposure in educational premises

A total number of 301 respondents indicated that they had visited an educational facility in the last 30 days. Figure 4.7 shows that 42.9% of the respondents had smelled tobacco smoke within the educational facilities and 57.1% had not smelled tobacco smoke within educational facilities.

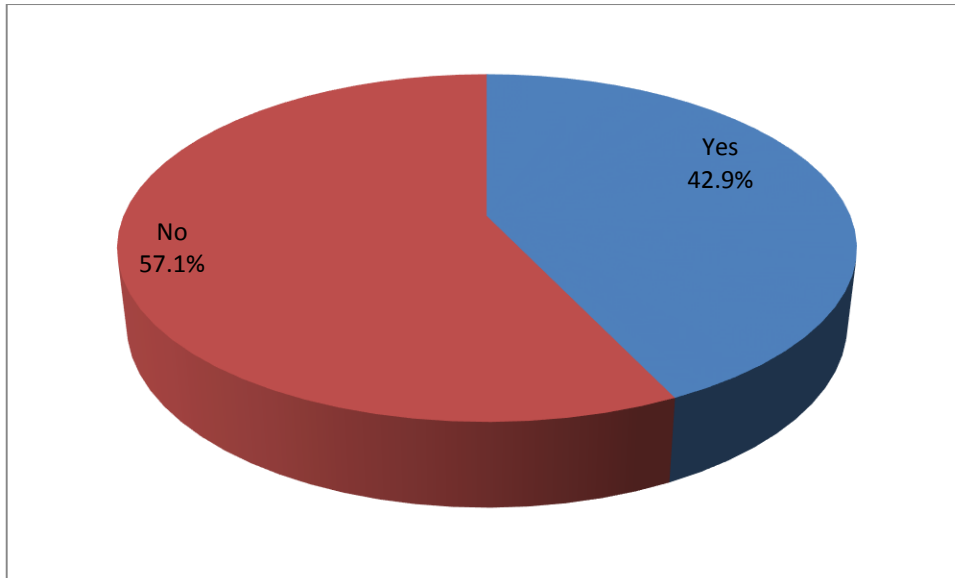


Figure 4.7 Respondents who smelled tobacco smoke in educational premises

Gender

The results as depicted in Table 4.11 below, established that males were more exposed (52.5%) to SHS within educational premises than females (34.4%). Males were 2.11 times more likely than females to smell tobacco smoke within educational premises. Pearson's Chi-Square ($p < 0.002$) suggests that there was a significant association between sex and SHS exposure in educational premises.

Table 4.11 Gender and SHS exposure in educational premises

		In the last 30 days did you smell tobacco in an educational premises you were in		Total	% exposed to SHS
		Yes	No		
Sex	Male	74	67	141	52.5
	Female	55	105	160	34.4
Total		129	172	301	42.9
Pearson chi-square: value 10.034; df 1; $p = 0.002$					

Age

Table 4.12 depicts the distribution by age, of respondents who smelled tobacco smoke within educational premises. There was decreasing exposure to SHS with increasing age. The younger persons (18-34 years) were more exposed to SHS at 49.4% than older persons at 37.6% and 27.5% for the age groups 35-54 years and 55 years and above respectively. There was a significant association ($p = 0.02$) between age and SHS exposure

within educational premises. Young persons (18-34 years) were 1.62 times more likely than those aged 35-54 years to see someone smoking or to smell tobacco smoke. They were 2.57 more likely than those aged 55 and above to be exposed to SHS within educational premises.

Table 4.12 Age and SHS exposure in educational premises

		In the last 30 days did you smell tobacco in an educational premises you were in		Total	% exposed to SHS
		Yes	No		
Age	18-34	83	85	168	49.4%
	35-54	35	58	93	37.6%
	>55	11	29	40	27.5%
Total		129	172	301	42.9%
Pearson chi-square: value 7.829; df 2; p 0.02					

4.3.5 Prevalence of second hand smoke exposure in food premises

Of the respondents (N= 342) who visited food premises in the last 30 days preceding the survey, 36.8% smelled tobacco in the food premises they were in, whereas 63.2% of the respondents did not smell any tobacco smoke within the food premises in the same period.

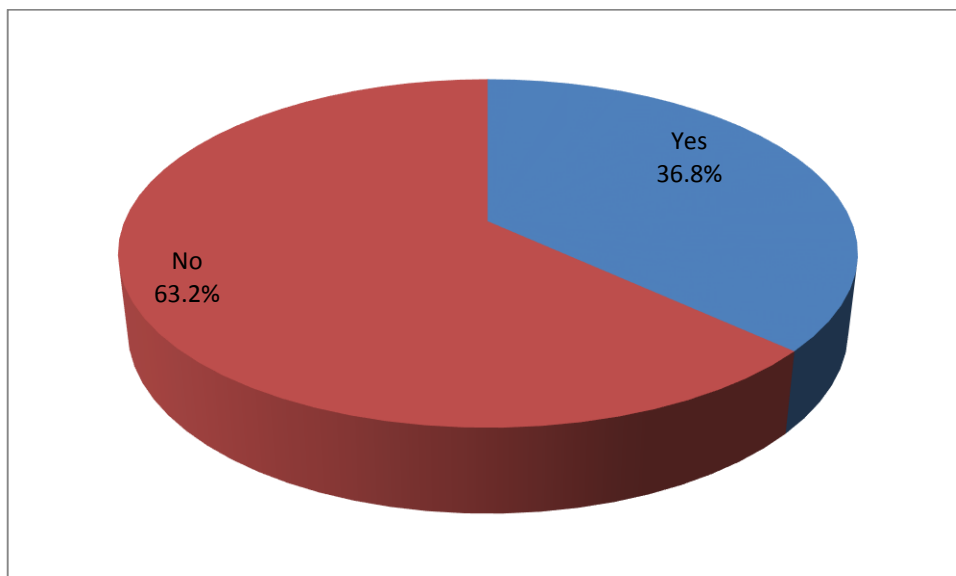


Figure 4.8 Respondents who smelled tobacco within food premises

Gender

Table 4.13 shows that slightly more males (37.6%) than females (36%) were exposed to SHS within food premises. The association between gender and SHS exposure in food premises was however insignificant according to the Pearson chi-square ($p=0.750$).

Table 4.13 Gender and SHS exposure in food premises

		In the last 30 days did you smell tobacco in food premises you were in		Total	% exposed to SHS
		Yes	No		
Gender	Male	67	111	178	37.6%
	Female	59	105	164	36.0%
Total		126	216	342	36.8%
Pearson chi-square: value 0.102; df 1; $p=0.75$					

Age

Table 4.14 shows the distribution of SHS exposure by age in food premises within the preceding 30 days. There were small differences between age groups in terms of smelling tobacco smoke within food premises. For ages 18-34, 35-54 and 55 and above the exposure to SHS was 37.8%, 38.9% and 27.3% respectively. The association between age and SHS exposure was, however, not significant according to the Pearson chi-square.

Table 4.14 Age and SHS exposure in food premises

		In the last 30 days did you smell tobacco smoke in food premises you were in		Total	% exposed to SHS
		Yes	No		
Age Grouped	18-34	70	115	185	37.8%
	35-54	44	69	113	38.9%
	>55	12	32	44	27.3%
Total		126	216	342	36.8%
Pearson chi-square: value 2.024; df 2; $p=0.364$					

4.3.6 Other places where respondents encountered SHS

The study, as shown in Table 4.15 also revealed that most respondents had encountered SHS in the streets, liquor premises and bus termini. Other places included stadia (18), retail outlets (14), parks (13), public toilets (8) and funerals (7).

Table 4.15 Other places where respondents have encountered SHS

Place	Number of respondents
Streets	90
Liquor premises	44
Bus terminus	42
Stadia	18
Retail outlets	14
Parks	13
Public toilets	8
Funerals	7

4.4 OBJECTIVE 2: TO ESTABLISH FACTORS CONTRIBUTING TO THE PREVALENCE OF SECOND HAND SMOKE EXPOSURE AMONG ADULTS IN BULAWAYO, ZIMBABWE.

4.4.1 Designation of No smoking zones in food premises

Of a total of 340 respondents that visited food outlets in the 30 days preceding the study, 65.9% reported having seen a designated NO SMOKING ZONE and 34.1% indicated that there were NO SMOKING ZONES in the food premises they had visited in the last 30 days.

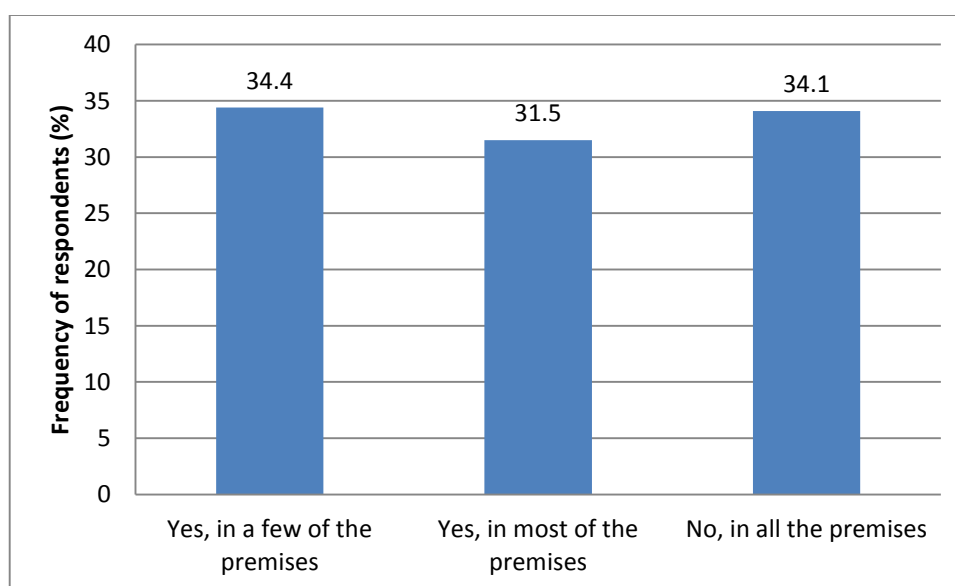


Figure 4.9 In the food premises you visited was there a no-smoking zone?

4.4.2 Knowledge of second hand smoke health effects

Figure 4.10 shows that almost all (97.4%) the respondents (N=419) knew that smoking was dangerous to human health, 1.7% of respondents were not sure if smoking was dangerous to human health or not and 1% answered that smoking was not harmful to human health.

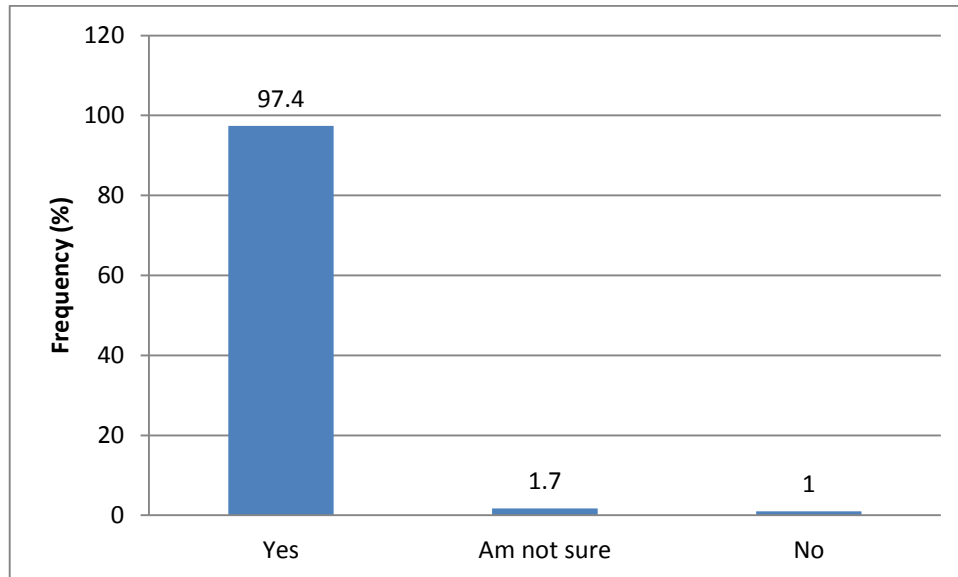


Figure 4.10 Smoking is dangerous to human health

Figure 4.11 shows that 63.2% of respondents (N= 419) correctly answered that a non-smoker could get cancer from breathing tobacco smoke from a smoker whereas 29.6% were not sure whether cancer could be caused by breathing tobacco smoke exhaled by a smoker. Respondents who incorrectly answered that a non-smoker could not develop cancer from breathing tobacco smoke exhaled by smokers were 7.2%.

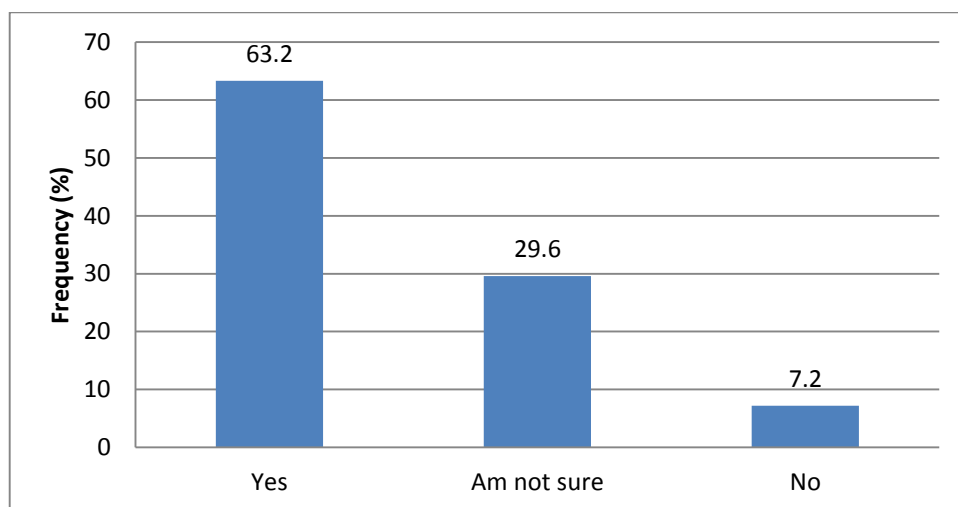


Figure 4.11 Can non-smokers get cancer from SHS

Figure 4.12 shows that the majority (69.2%) of the respondents (N=419) answered that unborn babies could be affected by SHS, whereas 22.4% were not sure whether unborn babies could be affected by SHS. The number of respondents who answered that unborn babies could not be affected by SHS was 8.4%.

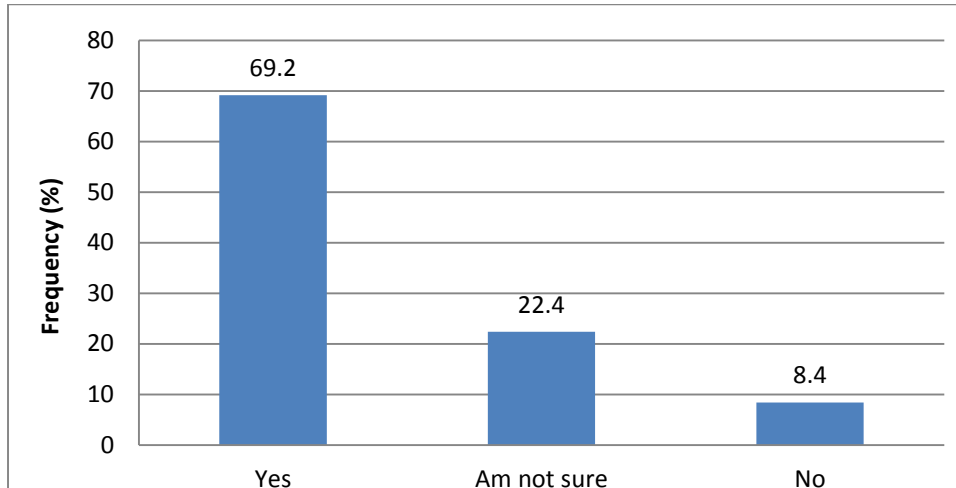


Figure 4.12 Can unborn babies be affected by SHS

Furthermore, to assess whether an individual had adequate or inadequate knowledge on SHS health effects these three questions were combined to give a new single variable “Knowledge of SHS health effects”. A respondent was deemed to having had adequate knowledge about the health effects of SHS if he/she correctly answered all the above three questions. Figure 4.13 shows that almost half (48.4%) of the respondents had inadequate knowledge on the health effects of SHS. In addition, there was no major difference in knowledge of SHS health effects amongst males (52%) and females (51.1%) as shown in Table 4.16. The new variable was used in multivariate regression analysis instead of the three questions.

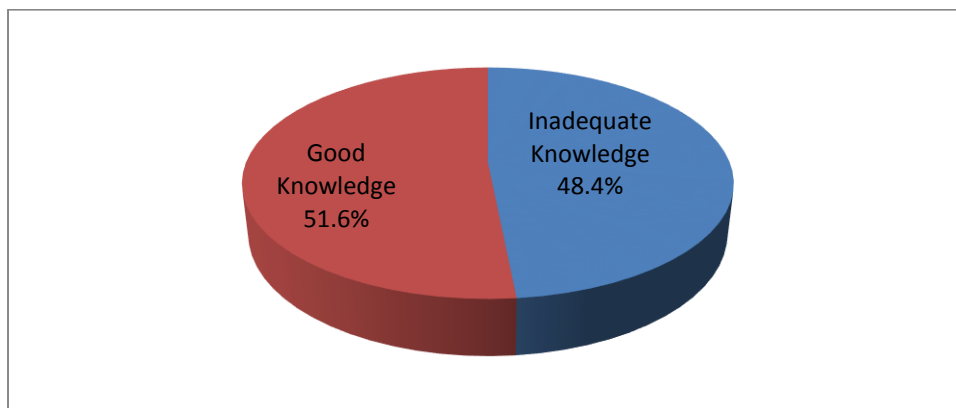


Figure 4.13 Respondents' knowledge on SHS health effects

Table 4.16 Knowledge of SHS health effects by gender

Knowledge of SHS health effects	Sex		Total
	Male	Female	
Inadequate Knowledge	96	107	203
Adequate Knowledge	104	112	216
Total	200	219	419
% with adequate knowledge by gender	52%	51.1%	

4.4.3 Knowledge of tobacco control legislation

According to Figure 4.14, 158 (37.7%) respondents correctly knew that a person can be arrested for smoking tobacco within school grounds. More than 60% of the respondents were either not sure (32.9%) or incorrectly indicated that a person who smokes tobacco within school grounds cannot be arrested (29.4%).

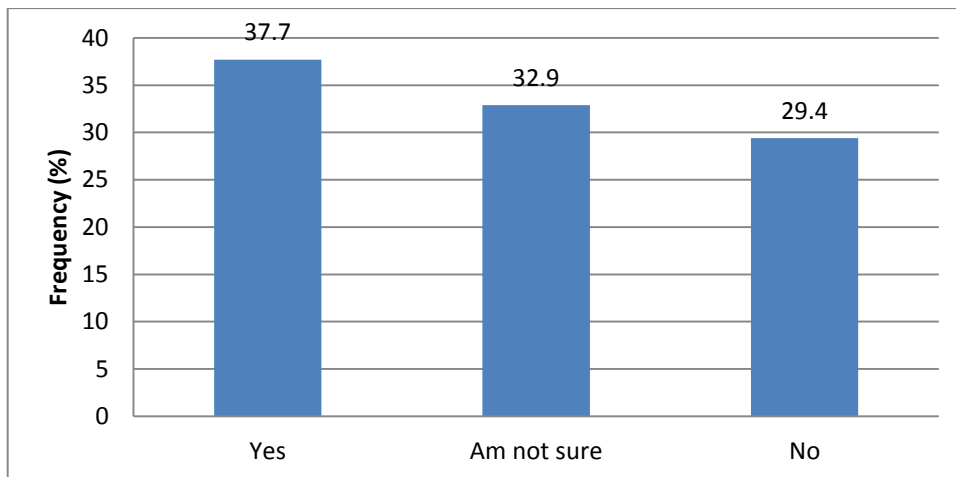


Figure 4.14 Can a person be arrested for smoking within school grounds

When asked whether a person can be arrested for smoking tobacco within hospital premises, slightly less than half (48.4%) of the respondents (N=419) indicated that a person could be arrested for smoking tobacco within hospital premises. Nearly a third (31%) of the respondents were not sure whether a person could be arrested or not for smoking within hospital premises. As depicted in Figure 4.15, 20.5% of the respondents stated that a person cannot be arrested for smoking tobacco within hospital premises.

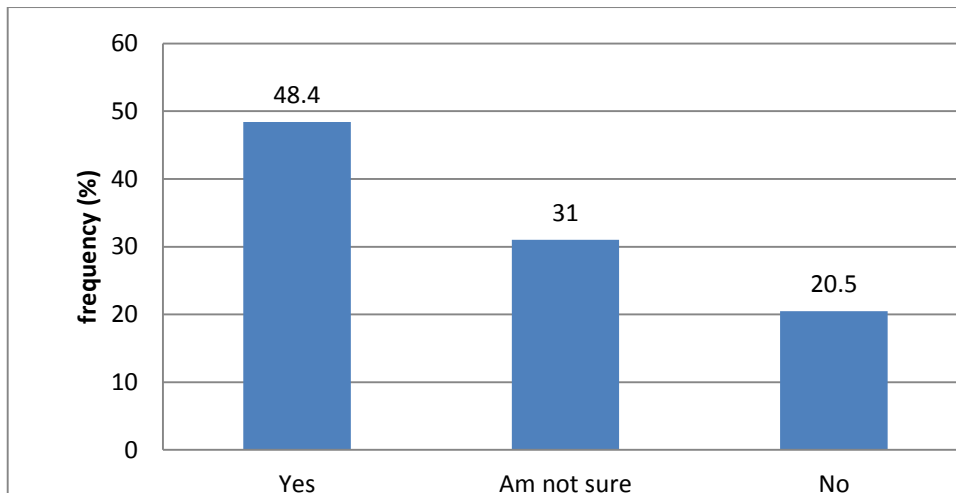


Figure 4.15 Can a person be arrested for smoking tobacco in a hospital

Furthermore, to assess if overall, the respondent had adequate or inadequate knowledge of tobacco control legislation the questions “Can a person be arrested for smoking within school grounds” and “Can a person be arrested for smoking tobacco in a hospital” were combined to give a new single variable “Knowledge of tobacco control legislation”. A respondent was coded as having adequate knowledge on tobacco control legislation if they answered yes to the two questions on tobacco control legislation. As shown in Figure 4.16 the majority (67.8%) of the respondents had inadequate knowledge on the tobacco control legislation. The new variable was used in multivariate regression analysis instead of the two questions.

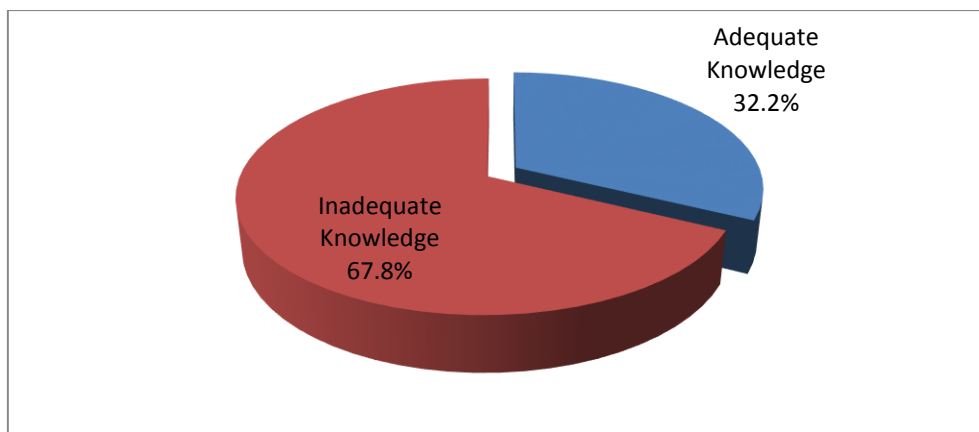


Figure 4.16 Respondents' knowledge on tobacco control legislation

4.4.4 Enforcement of tobacco control legislation

Almost (94.7%) all of the respondents (N=419) had never seen anyone being arrested for smoking in public places. Only 5.3% of the respondents, as shown in Figure 4.17, had witnessed someone being arrested for smoking in public.

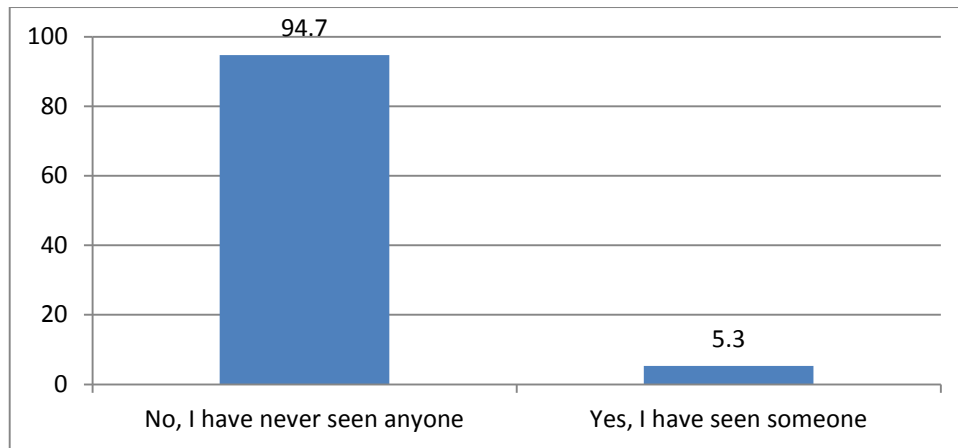


Figure 4.17 Respondents who saw people being arrested for smoking in public

This variable was entered into the regression model as it was, it was not re-coded.

4.4.5 Public attitude towards tobacco control

Table 4.17 depicts that two thirds (66.8%) of the respondents indicated that it was right for people who smoked in public to be arrested, whereas a fifth (20.5%) of the respondents thought it was not right. A small proportion (12.6%) of the respondents were not sure whether it was right or not to arrest people for public smoking.

Table 4.17 Perception on whether it is right to arrest people who smoke in public

		Frequency	Percent
Valid	Yes	280	66.8
	Am not sure	53	12.6
	No	86	20.5
Total		419	100.0

When asked what they thought about people who smoked in their presence, the majority of the respondents (86.2%) indicated that smokers should not be allowed to smoke near both children and adults. Yet, 7.6% thought that nothing can be done to smokers. Respondents who thought smokers should only be restricted from smoking near children were 4.5% whilst 1.7% thought smokers should be restricted from smoking near adults, as shown in Table 4.18.

Table 4.18 Respondents' attitude towards those who smoke in their presence

	Frequency	%
Nothing can be done to them	32	7.6
They should not be allowed to smoke near children	19	4.5
They should not be allowed to smoke near adults	7	1.7
They should not be allowed to smoke near both children and adults	361	86.2
Total	419	100.0

To assess the overall attitude of the respondent these two questions were then re-coded into one new variable "Attitude towards tobacco control". Respondents who thought it was right to arrest people who smoked in public and those who indicated that smokers should not be allowed to smoke near both children and adults were coded as having a positive attitude towards tobacco control activities. Those who responded otherwise were coded as having a negative attitude towards tobacco control activities. The result of the analysis showed that 59.7 % favoured while 40.3% were against tobacco control activities (Figure 4.18). This new variable was used in multivariate regression analysis in place of the two questions.

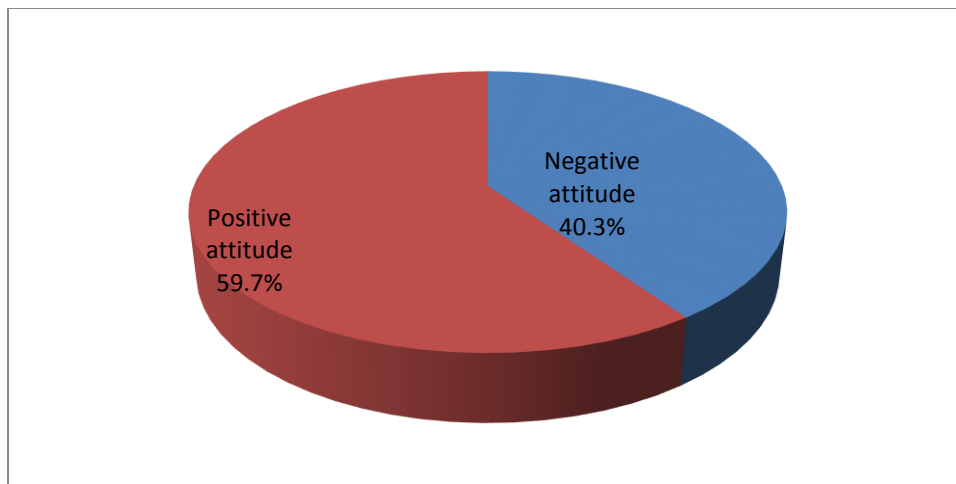


Figure 4.18 Public attitude towards tobacco control

4.4.6 Health education influence

Figure 4.19 depicts the respondents' (N=418) last encounter with SHS education from a health worker. The majority of the respondents (59.1%) had never heard any health worker giving a lesson of the dangers of SHS to non-smokers. Respondents who indicated that they last heard a health worker giving a lesson on SHS more than 3 months ago were 26.3%. Those who had last heard a health worker giving such a lesson in a period more than one month but less than 3 months were 6.9%. Only a few of the respondents had heard health

workers giving a lesson in a fairly recent time. Those who had heard SHS lesson in the last week and in a period of 2-4 weeks were both 3.8%.

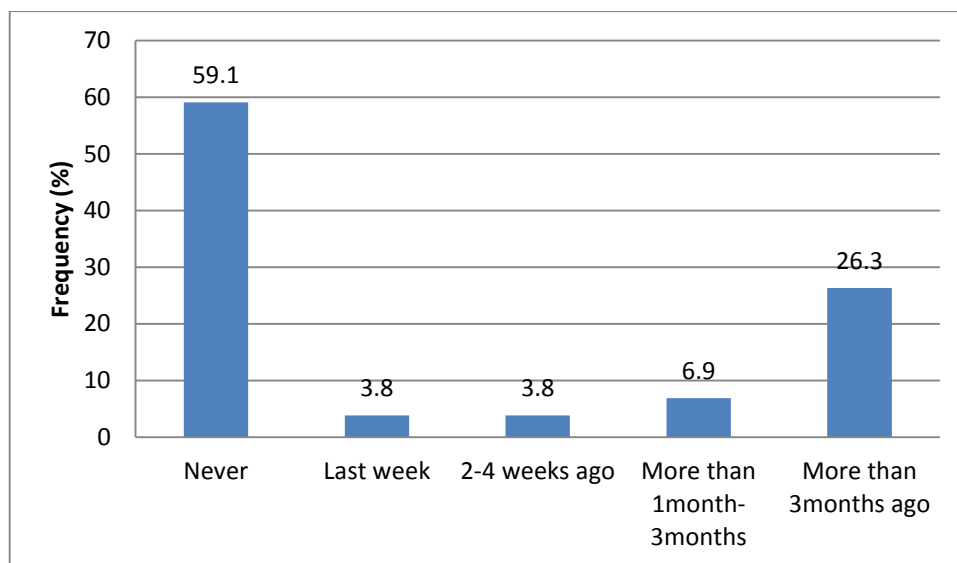


Figure 4.19 Respondents' last encounter with SHS education from a health worker

Pamphlets and posters form an important vehicle for educating the public on health issues. This study established that 38.7% of the respondents had never read or seen any pamphlet or poster on the dangers of tobacco smoke to non-smokers (Figure 4.20). Less than a fifth (17.4%) of the respondents had read or seen a pamphlet or poster on the dangers of SHS in the last week preceding the survey. The percentage of those who had read or seen a pamphlet in the 2-4 weeks preceding the survey was equal at 9.1% to those who had last seen a pamphlet or poster 1-3 months ago. About one in every fourth person had last seen a pamphlet or poster on SHS more than 3 months ago.

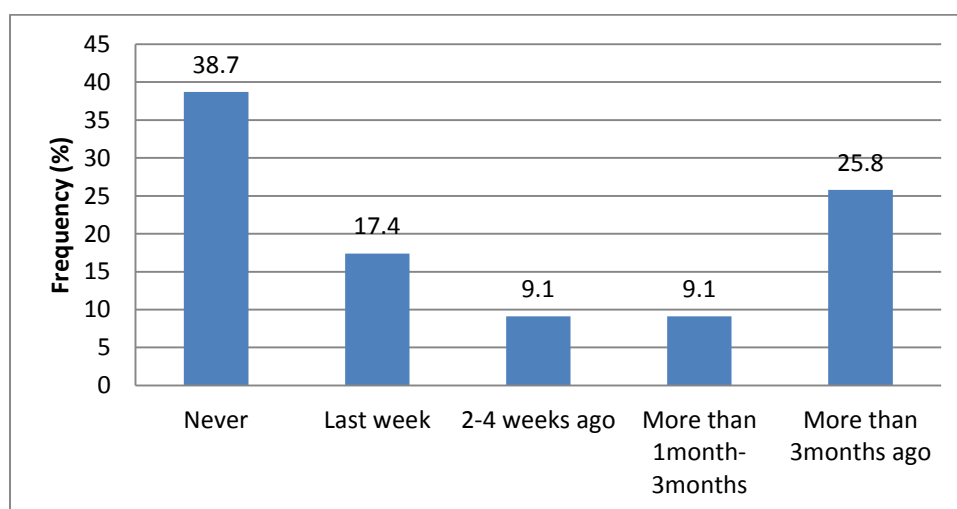


Figure 4.20 Respondents' last encounter with a pamphlet or poster on SHS

The two questions on last encounter with SHS lessons delivered by a health worker as well as the last encounter with a pamphlet or poster were further combined to give a new variable “Health education influence”. Active health education was deemed as having had a last encounter with both a lesson delivered by a health worker and having seen a pamphlet on SHS in a period of 4 weeks or less. Never or having last seen a SHS poster or having heard a health worker teaching on SHS in a period of more than 4 weeks ago was coded as inactive health education. Only 3.8% of the respondents as shown in Figure 4.21 were subjected to active health education in the preceding 4 weeks. This new variable was used on the regression analysis in place of the two questions.

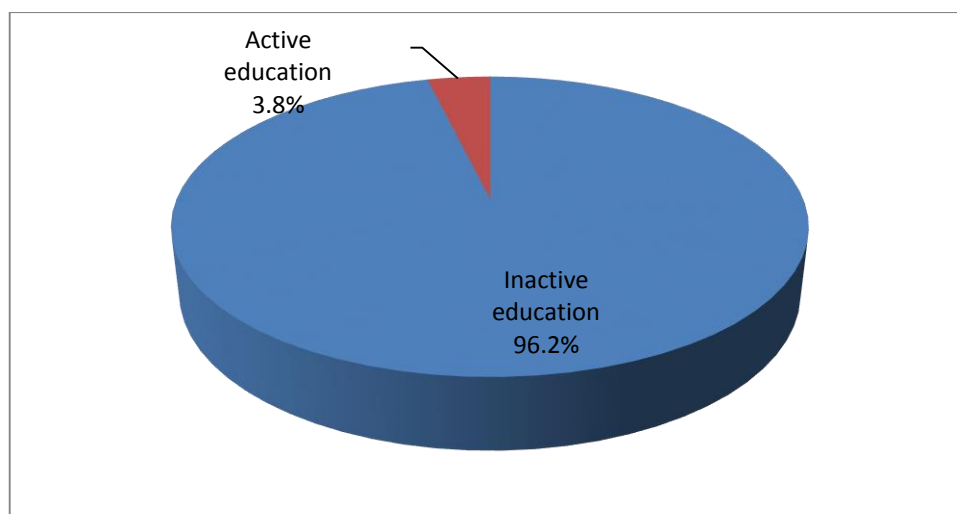


Figure 4.21 Health education influence

4.4.7 Media influence

The media plays an important role in educating the public on any issue of interest. In as far as educating the public on the dangers of tobacco smoke to non-smokers, 50% of the respondents reported that they had never seen or read a newspaper article on SHS. Only slightly less than 10% of the respondents reported to having read or saw a newspaper article on the dangers of SHS in the last week preceding the survey. 5.1% of the respondents indicated that they last read or saw a newspaper article with a story on the dangers of SHS 2-4 weeks ago. Respondents who had read or seen a newspaper articles on SHS 1-3 months ago were 8.5%, whereas slightly above a quarter had read or seen a newspaper article on SHS more than 3 months ago.

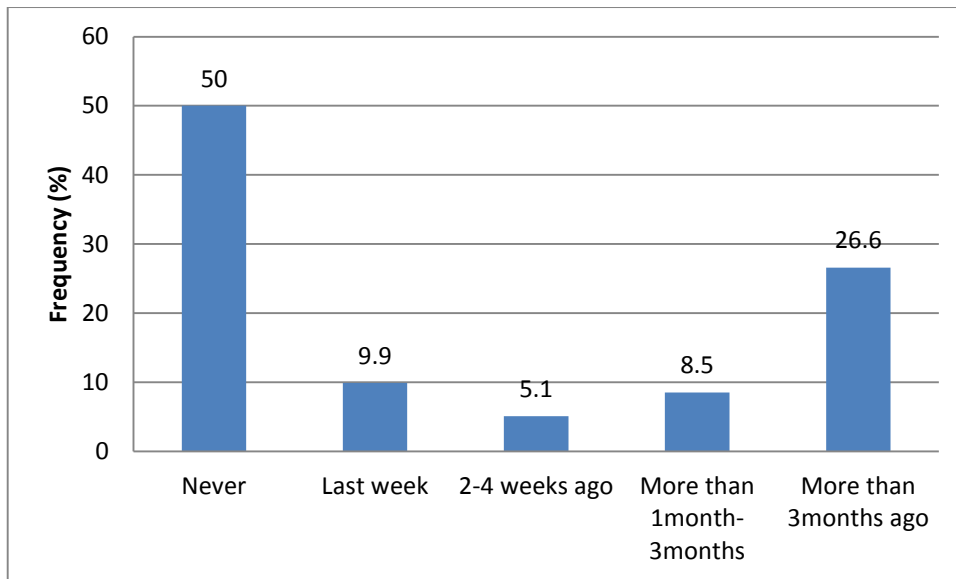


Figure 4.22 Respondents' last encounter with a newspaper article on dangers of SHS

For regression analysis, this question was re-coded into a dummy variable with two outcomes- “non-active media influence” and “active media influence”. A respondent who last saw a newspaper article in a period of four weeks or less was coded as having been subjected to active media influence whereas the one who had never seen or last seen more a newspaper article than four weeks ago was coded as having been subject to non-active media influence. Figure 4.22 shows that 85% of the respondents had never or had last seen a newspaper articles more than four weeks ago. Only 15% of the respondents had seen a newspaper article in a period of four weeks and less.

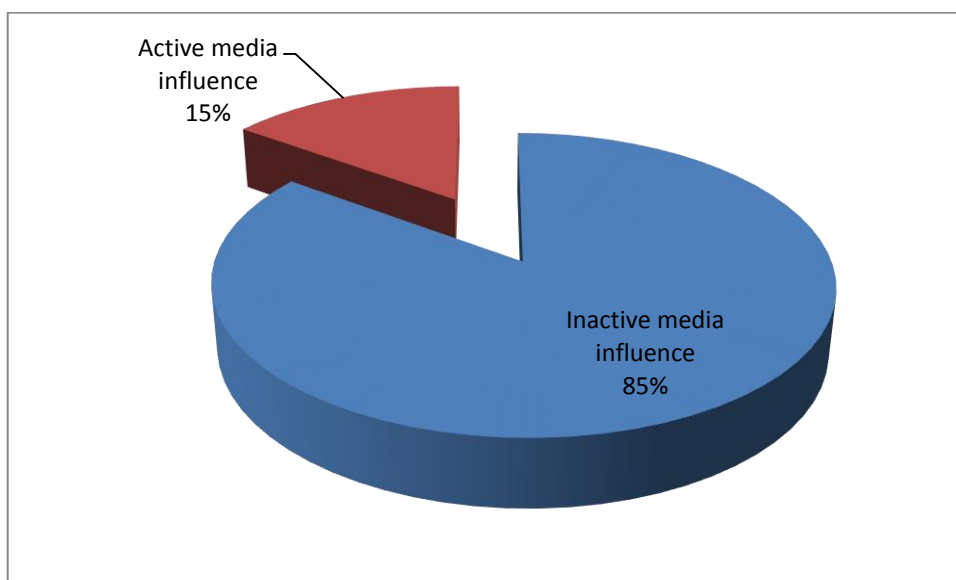


Figure 4.23 Media Influence

4.4.8 Knowledge and attitudinal factors

A logistic regression analysis was conducted to predict SHS exposure within the home using as predictors, 6 knowledge and attitudinal factors re-coded as shown below in Table 4.19. Exposure to SHS at home was the dependent variable.

Table 4.19 Independent Variables for logistic regression analysis

Variable	Constituting Questions	Criteria
1. Knowledge of SHS health effects	15. Smoking is dangerous to human health 16. A person who does not smoke can get cancer from breathing tobacco smoke puffed by a smoker 17. Unborn babies can be affected by second hand smoke”	*If responses to all 3 questions are yes = Adequate Knowledge *0,1 or 2 ‘yes’ to the 3 questions= Inadequate Knowledge
2. Knowledge of tobacco control legislation	18. Can a person be arrested for smoking tobacco within school grounds? 19. Can a person be arrested for smoking tobacco in a hospital	*2 ‘yes’ responses = Adequate Knowledge *0 or 1 ‘yes’ responses = Inadequate knowledge
3. Seeing anyone being arrested	20. Have you ever seen anyone being arrested for smoking in a public place?	*Seeing anyone being arrested=positive effect *Not seeing anyone being arrested = negative effect
4. Attitude towards tobacco control	21. Is it right to arrest people who smoke in public? 22. What do you think of people who smoke in your presence?	*Positive attitude = selecting ‘yes’ in Q21 and selecting fourth option in Q22 *Negative attitude = selecting ‘no’ in Q21 and any other option besides 4 in Q22
5. Health Education Influence	23. When was the last time you heard a health worker giving a lesson on the dangers of tobacco smoke to non-smokers? 24. When was the last time you read or saw a pamphlet or poster on the dangers of tobacco smoke to non-smokers	*Active Health Education = selecting 4 weeks or less *Non-active Health Education= selecting responses never or more than 4 weeks
6. Media influence	25. When was the last time you read or saw a newspaper with a story on dangers of second hand smoking?	*Active Health Education = selecting 4 weeks or less *Non-active Health Education= selecting responses never or more than 4 weeks

Statistics were performed using SPSS version 22. The six variables were analysed using the forward stepwise method. A variable with a *p*-value of <0.05 was considered statistically significant. Table 4.19 shows the logistic regression coefficient (B), the standard error (S.E) associated with the logistic regression coefficient, Wald criterion, degrees of freedom (d.f),

significance (sig) of the Wald criterion and the odds ratio (Exp(B)) for the significant co-variates. The score, degrees of freedom (df) and the significance for the insignificant variables is also given. All the co-variates were categorical and the baseline reference categories that were chosen are all denoted by 1 in parenthesis. For the 'knowledge of SHS health effects' co-variate adequate knowledge was chosen as the baseline reference category. Adequate knowledge was chosen as the baseline reference category for the 'knowledge of tobacco control legislation co-variate'. Having seen anyone being arrested for tobacco smoking was chosen for the co-variate "seeing anyone being arrested". Negative attitude towards tobacco control was chosen as the reference baseline category for the co-variate 'Attitude towards tobacco control'. Active health education was selected as the baseline reference category for the "Health education influence" co-variate. Active media influence was chosen as the baseline reference category for the co-variate "Media Influence".

Table 4.20 shows that only knowledge of tobacco control legislation and seeing someone being arrested for smoking tobacco in public were significant predictors of SHS exposure at home. The table shows adequate knowledge of tobacco control reduces the chance of SHS exposure at home by 0.555 whereas seeing anyone being arrested for tobacco smoking reduces the likelihood of SHS exposure by 0.323.

Table 4.20 Significant and insignificant variables

Significant variables						
	B	S.E	Wald	df	Sig.	Exp(B)
Knowledge of tobacco control legislation(1)	-0.588	0.245	5.774	1	.016	0.555
Seeing any one being arrested(1)	-1.130	0.462	5.993	1	.014	0.323
Insignificant variables						
	Score		df		Sig.	
Knowledge of SHS health effects (1)	0.505		1		0.478	
Attitude towards tobacco control (1)	1.399		1		0.237	
Health education influence (1)	0.139		1		0.710	
Media Influence (1)	2.511		1		0.113	

4.5 SUMMARY OF RESULTS

- ✓ 419 respondents took part in this study
- ✓ 52.3% of the respondents were females, whereas 47.7% were males
- ✓ 22% of the respondents were exposed to SHS at home

- ✓ Females were 2.1 times more likely than males to be exposed to SHS at home than males
- ✓ The odds of SHS exposure were decreasing with increasing age with the home setting
- ✓ 40.9% of respondents had smelled tobacco smoke within public transportation in the last 30 days preceding the study
- ✓ 26.3% of respondents had smelled tobacco smoke within public transportation in the last 30 days preceding the study
- ✓ 42.9% of the respondents had smelled tobacco smoke within educational premises
- ✓ Males were 2.11 times more likely than females to be exposed to SHS within educational premises
- ✓ Younger persons (18-34) were 2.57 times more likely than older persons to be exposed to SHS within educational premises
- ✓ 36.8% of the respondents had smelled tobacco smoke within food premises
- ✓ 48.4% of the respondents could not correctly answer all questions of SHS health effects
- ✓ 53.2% of the respondents could not correctly answer all questions on tobacco control legislation
- ✓ Only 5.3% of the respondents had ever seen a person being arrested for smoking tobacco in public
- ✓ 33.1% of the respondents did not think or were not sure if it was right to arrest people for smoking in public
- ✓ Knowledge on tobacco control legislation and seeing a person being arrested for tobacco smoke were significant predictors of SHS exposure at home

4.6 CONCLUSION

In this chapter, the results that were obtained in this study for prevalence of SHS exposure in the home, public transportation, health care, educational and food premises have been presented. The relationships between SHS exposure and demographic, knowledge, attitudinal and enforcement factors were also presented using contingency tables and bar charts. The next chapter will discuss the results that have been presented herein.

CHAPTER 5

DISCUSSION OF MAJOR FINDINGS, LIMITATIONS, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The previous chapter presented results that were obtained in the study and this chapter discusses those results. The discussion is focused on the prevalence and the underlying factors of SHS exposure that were established for the home, public transportation, health, educational and food premises. The home being an important setting which is, however, unregulated will be discussed in detail. Study demographic data will also be discussed.

5.2 DEMOGRAPHIC DATA

5.2.1 Age

In this study young persons aged 18-24 constituted 23.2% of the respondents, those aged 25-44 constituted 44.4% whilst those aged 45-64 constituted 28.6%. Persons aged 65 and above constituted 3.8%. These findings were generally reflective of the age distribution in Bulawayo, Zimbabwe and many African populations. Nearly similar findings were reported in a GATS conducted in Nigeria where respondents aged 15-24 constituted 34.4%, those aged 25-44 were 43.8%, those aged 45-64 were 16.2% and those aged 65 and above were 5.6% (Nigeria, 2012). The results might be generally reflective of comparable socio-economic and cultural parameters among African countries. The Bulawayo, Zimbabwe and Nigeria findings are in sharp contrast to what was reported by Pereira et al (2013) where adults aged 65 and above accounted for 36.3% of the total respondents. The difference is expected given that the study by Pereira et al (2013) was conducted in Portugal, a country with generally different socioeconomic and cultural parameters to Africa. It is expected that, in a properly sampled study, the age of respondents should generally be consistent with the demographic trend of the general population, which was the case in this particular study.

In terms of the recruitment age, there were similarities between Pereira et al (2013) and Nigeria (2012) as both studies recruited those aged 15 and above as adult respondents. This study, however, deemed an adult as anyone with 18 years and above. This was based on the age of legal majority as prescribed by General Law Amendment Act (Zimbabwe, 2006)

5.2.2 Gender

The findings indicated that there were more females (52.3%) than males (47.7%) recruited in this study. This was consistent with the gender distribution in Bulawayo where according to Zimbabwe National Statistics Agency (2013), there were 53.6% females and 46.4% males. The closeness of the sample to the general population is reflective of an effective and robust sampling protocol that was employed in this study. It testifies that the simple random sampling was able to recruit respondents who were representative of the general population of Bulawayo and this adds a degree of certainty to the general applicability of the results of this study to the Bulawayo community.

5.3 PREVALENCE OF SECOND HAND SMOKE EXPOSURE IN DIFFERENT SETTINGS

5.3.1 Prevalence of second hand smoke exposure in homes

WHO (2009a) suggests that the home is the single most important setting because it is where the bulk of SHS exposure occurs, and in this study 22% of the non-smoking adults were found to have been exposed to SHS at home. Exposure to SHS at home in this study, was seen as living with one or more smoker who smoked for more than a minute in the presence of these non-smoking respondents. This was, however, a conservative definition considering that smoke from a person smoking tobacco in a different room with a non-smoker can easily permeate the air to affect the non-smoker (Lambert & Donley, 2013). In Pereira et al (2013) exposure to SHS was simply defined as living with at least one current smoker. The definition by Pereira et al (2013) was suitable since according to the CDC (2010), nearly all non-smokers who live with someone who smokes inside their home are exposed to SHS. Furthermore, it is important to note that a non-smoker can be exposed to SHS even if the smoker does not smoke in their presence since toxic chemicals from SHS contamination can persist well beyond the period of active smoking (WHO, 2009a). The crucial debilitating factor against the definition used by Pereira et al (2013) is that it failed to take into account that there could be strict smoking bans within the household that have been agreed upon by family members. It also fails to realise that by practice or consensus a current smoker might only be smoking in other places other than the home. Thus, to improve on the shortcomings highlighted in the definition used by Pereira et al (2013) a non-smoker was regarded as being exposed to SHS only when a smoker smoked in their presence.

The results of this study were comparable to those of the GYTS where 22.6% of youths in Bulawayo reported that someone smoked in their presence at home. Similarly, Pereira et al (2013) reported that 26.6% of adults in Portugal were exposed to SHS at home. The

prevalence of SHS exposure at home established in this study was, however, lower than that reported for India (52%) and Egypt (45.6%) but higher than that reported for Kenya (14.3%), Uganda (13.1%) and Nigeria (4.6%). Probably, the differences in SHS exposure prevalence among the cited examples are a function of tobacco smoking rates in the general population in the respective study sites. India is the second largest consumer of tobacco products in the world, whereas in Egypt 19.4% of adults were current smokers. Countries with lower home SHS exposure had lower tobacco smoking rates when compared to Zimbabwe. In Kenya, 7.8%, in Uganda 5.8% and in Nigeria 3.9% of the population were smokers

Notwithstanding the methodological differences between this survey and GATS, the prevalence of SHS exposure within homes in Bulawayo, Zimbabwe is higher than that reported for most African countries that have conducted GATS. Oberg et al (2011) estimated that the proportion of adults exposed to SHS in WHO African Region D which includes Zimbabwe was 4% for males and 9% for females. Considering the proportions of males (15.5%) and females (27.8%) exposed to SHS at home it is clear that SHS exposure prevalence in Bulawayo, Zimbabwe is higher than most of the countries neighbouring Zimbabwe.

Gender

The study established that 27.8% of non-smoking females were exposed to SHS at home, a higher percentage when compared to 15.5% of exposed males. This trend was consistent with studies conducted in other countries. In Indonesia, 75% of non-smoking adult women were exposed to SHS compared to 62% of men at home, in Nigeria 5.4% of non-smoking adult women were exposed to SHS compared to 3.7% of men at home, whereas in Bangladesh 46.7% of the women were reportedly exposed to SHS (Fischer et al, 2014; Nigeria, 2012; WHO, 2012). Wang et al (2009) in their study conducted in China established through a multivariate logistic regression analysis, that there was a significant association between high SHS exposure and being female. Similarly, in this study the Pearson chi-square ($p=0.002$) suggests that the association between SHS exposure at home and gender was significant.

It is important to note that in Bulawayo there are more male smokers (18%) than female smokers (0.1%), yet, when it comes to exposure more females are exposed than males. This suggests that many male smokers smoke in the presence of non-smoking females than in the presence of non-smoking males. As noted in Shafey et al (2009), in Africa women are more exposed at home to tobacco smoke mainly from male family members who are tobacco smokers. Generally, women in Bulawayo are expected, according to the African

culture and tradition, to be submissive to men. They cannot strongly object to actions of men and thus women suffer silently for fear of reprisals from the 'head of the family'. Gharaibeh et al (2011) suggest that authoritarian culture and male dominated family structures such as those existing in Bulawayo, Zimbabwe might be responsible for the higher SHS exposure rate among women. The interaction between male tobacco smokers and male non-smokers could be slightly different to that of male smoker and female non-smoker. It is highly likely that smoking males did not smoke in the company of their male counterparts whom they knew objected to tobacco smoking.

Furthermore, the study revealed that males (52%) and females (51.1%) were equally knowledgeable on SHS health effects suggesting that male domination may be responsible for more females being exposed to SHS at home. This is supported by the fact that females were 2.1 times more exposed to SHS than males at home. It suffices to say that there is need for tobacco control programs that will seek to empower women to take an effective role in tobacco control activities and thus protect them from SHS exposure within the household.

Age

This study revealed that the odds of being exposed to SHS at home were decreasing with increasing age. An almost similar trend has been reported in previous studies (Abdullah et al, 2014; Nigeria, 2012; Pereira et al, 2013 & WHO, 2009) where younger persons were more exposed to SHS than older persons.

In Bulawayo, this trend could be ascribed to socio-cultural structure and socio-economic status factors. A large proportion of persons aged 18-34 do not own houses in Bulawayo, they live with their parents. It is probable that smokers in the household are fathers or brothers whom, culturally, younger persons cannot rebuke for smoking in their presence. The younger persons due to the prevailing economic situation, cannot move out of home and rent their own house where they won't be exposed to SHS. Furthermore, at the home, this high percentage of exposure among younger persons could be a result of young people exposing one another to SHS. A tobacco smoking young person would most likely smoke and puff tobacco smoke in the presence of his sibling or peer than in the presence of an older person.

Education

This study did not find any association between educational attainment and home SHS exposure which was highest (24.9%) among those with secondary education level, followed

by those with college/university education level (19.6%) and those with the least educational level (18.3%). This was contrary to what has been reported elsewhere. In Homa et al (2015) serum cotinine levels from participants in United States of America, indicated that those with low educational attainment were most exposed to SHS at 27.6% and those with high educational attainment had lower prevalence of SHS exposure at 11.8%. In Indonesia, according to WHO (2012), adult non-smokers with the highest educational level (college and university level) had the lowest exposure to SHS at home (49.2%) as compared to the people with less than primary level (78.1%). In Nigeria 1.7% of adult non-smokers with a post-secondary/ high school education were exposed to SHS compared to 5.0% adult non-smokers with primary school or less.

The findings of this study seem to throw credence to what was reported in Gharaibeh et al (2011) where a sample of Jordanian university staff was conveniently sampled to test the common belief that educated working women experience less SHS exposure than women with poor education or lower SES. In that study, it was established that almost two thirds (59.6%) of subjects were exposed to SHS at their homes and almost half (48.8%) of the women were ignorant of the anti-smoking policies that their institutions had. Gharabeh et al (2011) concluded that the common belief that high education translates to low SHS exposure was misplaced. This lack of association between educational attainment and home SHS exposure implies that educational attainment or the lack of, does not infer any protective effect nor does it pose an additional risk against home SHS exposure in Bulawayo.

5.3.2 Prevalence of second hand smoke exposure in public transportation

Public transport is one of the commonly used modes of transport in Bulawayo, Zimbabwe. It comprises of four-seater taxi cabs, 18-seater emergency taxis, 35-seater minibuses, 60-76 seater buses as well as the train. The study suggests that the prevalence of SHS in public transport in Bulawayo, Zimbabwe was 40.9%. In Egypt, 70% of the population was exposed to SHS within public transport in the 30 days preceding the survey whereas in Uganda 7.8% and in Nigeria 4.6% of non-smokers were similarly exposed (Nigeria 2012; Uganda 2013; WHO 2010b). In Zimbabwe, the tobacco control regulations state that smoking within public transportation is prohibited and 40.9% of respondents exposed to SHS within public transport is rather worrying. It is perhaps reflective of the level of tobacco legislation enforcement that is obtaining in the country. Only 5% of the respondents reported ever seeing a person being arrested for smoking in unauthorised public area. The study showed that respondents did not have adequate knowledge of the country's tobacco control

legislation. This high prevalence of SHS exposure within public transport is also suggestive of inadequate knowledge that public transport operators and commuters have on tobacco control legislation. There is need to educate public transport owners and commuters in Bulawayo on tobacco control in general and specifically on the provisions of the law on tobacco smoking within public transportation. The onus on enforcing no smoking within public transportation should also be placed on the public transport operators as reliance on the few government enforcement agents will not be effective. The media should also be encouraged to play an effective role in raising awareness on the dangers and inappropriateness of smoking within public transportation.

5.3.3 Prevalence of second hand smoke exposure in health facilities

Health facilities are hospitals, clinics, medical laboratories or any other premises used by health practitioners for diagnosis or treatment of illnesses, injury or disability. These are places where people go to restore their health and not to be exposed to disease-causing-circumstance such as being exposed to SHS yet this study revealed that 26.3% of the respondents had smelled tobacco smoke in a health facility in the 30 days preceding the study. Similarly, several other studies have reported presence of SHS exposure in health facilities. According to the WHO (2010b) in Egypt, 49.2% respondents reported to having been exposed to SHS in the hospital within the 30 days preceding that survey. In Bangladesh, India and Nigeria prevalence of SHS exposure in health premises in the preceding 30 days ranged between 5-6% (India, 2010; Nigeria, 2012; WHO, 2009b). This low SHS exposure prevalence is suggestive of greater observance and enforcement of tobacco control legislation in health facilities in those countries.

This study revealed that 57.2% of those aged 35 and above and nearly a quarter (23.9%) of those aged 18-34 had smelled tobacco smoke within a health facility in the last 30 days. The findings were nearly similar to what was obtained in Indonesia where the prevalence of SHS exposure was higher among those aged 45-64 than in other ages groups (WHO, 2012). Though the relationship between age and SHS exposure in health facilities was not statistically significant in this study, it is proffered that the differences in these age groups could probably due to the fact that more older persons (35+) visit health facilities than younger persons (<35).

It is worth noting that in terms of the Public Health (Tobacco Control) Regulations, 2002 no person should smoke tobacco within health premises, yet this study revealed that more than half (51.5%) of the respondents did not know that it was illegal. In a setting where SHS exposure should be zero, the proportion (26.3%) of respondents who reported to have been

exposed to SHS in health facilities is considerably high. It suggests that the health authorities are unaware of tobacco control legislation or that they have challenges in enforcing the law or that they have a negative attitude towards tobacco control. There is need to reduce SHS exposure within health facilities.

5.3.4 Prevalence of second hand smoke exposure in educational premises

Educational premises are pre-schools, primary schools, secondary schools, technical colleges, vocational colleges, university or any premises where people gather to receive education. A significant proportion (42.9%) of the respondents smelled tobacco smoke within educational premises in the 30 days preceding this study whereas 30.2% of adults were exposed to SHS in Kenyan universities and only 2% of non-smoking adults were exposed to SHS in educational facilities in Nigeria (Kenya, 2014; Nigeria, 2012). The study revealed that males and the age group 18-34 years were the most exposed to SHS in educational premises in Bulawayo.

In terms of the Zimbabwean tobacco control legislation, smoking within educational premises is prohibited, yet 42.9% of the respondents were exposed to SHS therein. Despite the tobacco control regulations having been promulgated in 2002, 62.3% of the respondents did not know that smoking was prohibited within school premises. This, similarly to the knowledge on the provisions of the law on smoking within health premises, is suggestive of poor enforcement or inadequate knowledge on SHS health effects and on tobacco control legislation.

Unlike in the home where more females (27.9%) than males (15.5%) were exposed to SHS within educational premises, about one male in every two (52.5%) was exposed to SHS compared to about one female in every three (34.4%). This was consistent with other studies where males were more exposed in some settings other than the home. In Brazil, Indonesia and Nigeria, in settings such as the workplace, restaurants and transport, males were more exposed to SHS than females (Instituto Nacional de Cancer Brasil, 2010; Nigeria, 2012; WHO, 2012).

The indication that more males were exposed to SHS within educational premises in Bulawayo was reflective of the smoking trend in the population. There were more male smokers than female smokers in the city and, assuming that in educational premises there was more of male-to-male interaction than male-to-female interaction, it would suggest that male smokers exposed more of their own kind than females. Furthermore, it should be noted

that in settings such as educational institutions, females have the freedom of choosing whom they associate with. In a home if the father, husband or brother is a smoker the female family member has nowhere to go other than to stay put in the homestead and be exposed to SHS. In premises such as a school or college females can choose not to go near areas where they will be exposed to tobacco smoke, thus the lesser SHS exposure in such settings.

Exposure could be higher in the age group 18-35 as this age group is the one mostly found in schools. More importantly, this could be reflective of peer to peer exposure.

5.3.5 Prevalence of second hand smoke exposure in food premises

Food premises are any premises where food is prepared or sold for consumption on or off the premises. These premises include coffee shops, restaurants and takeaways and are one of the areas where non-smokers are exposed to SHS. In Nigeria, 27.6% of the respondents were exposed to SHS within restaurants they had visited in the 30 days preceding that survey whilst in Kenya 21.2% were similarly exposed. In Bulawayo, a higher proportion (36.8%) of the respondents reported to having smelled tobacco smoke within the food premises they went to in the 30 days preceding the study.

SHS exposure in Bulawayo food premises could be perpetuated by the current legislation. The national tobacco control regulations do not prohibit smoking in food premises but allow for the establishment of smoking zones within the food premises. The smoking zones that are created can be up to 20% of the food premises floor space. These regulations have failed to take cognisance of recent research findings. According to Lambert and Donley (2013) and WHO (2013) the provision of no smoking zones does not confer smokers with protection from SHS. Smoking zones in Bulawayo are therefore providing a fallacious sense of protection to non-smokers and this poses danger to them as they are likely to assume that because they are in non-smoking zones they are safe from SHS.

Males and females were nearly equally exposed to SHS probably because there were no apparent perceived gender restrictions in food premises. Age groups 18-34 years and 35-54 years constituted the bulk of the respondents who were exposed to SHS. The association between age and SHS exposure in food premises was, however, insignificant.

5.3.6 Prevalence of second hand smoke exposure in other settings

Respondents indicated that they were exposed to SHS in other settings such as streets, liquor premises, termini, public toilets to mention a few. This suggests that SHS exposure is almost ubiquitous in Bulawayo and the fact that people go around smoking in streets, bus

termini is reflective of inadequacy of knowledge on harmfulness of tobacco smoke in the general population. This further reinforced the argument discussed earlier on that there is a need to control SHS exposure in all public places.

5.4 KNOWLEDGE, ATTITUDE AND ENFORCEMENT FACTORS

A large number of the respondents (97.4%) correctly knew that smoking causes lung cancer but fewer respondents knew that SHS could affect unborn babies (69.2%) or that SHS could cause cancer in non-smokers (63.3%). This finding resonates closely to what was reported in ITC, WHO and World Heart Federation (2012) that a significant proportion of non-smokers ranging from 88% in Vietnam to 5% in Thailand did not know or believe that SHS exposure could cause diseases such as of the heart.

Whilst knowledge of SHS health effects is important at home there are other strong factors such as cultural factors that might ensure that adequate knowledge of SHS health effects, active health education, active media influence or the right attitude towards tobacco control do not translate to SHS exposure protective practices at the home. Knowledge of tobacco control legislation and seeing someone being arrested for smoking tobacco in prohibited public areas was found to be significant predictors of home SHS exposure. This is reflective of the dominant power of the law over culture. People are bound to conform if they know that what they are doing is going to get them prosecuted. This suggests that increased enforcement of tobacco control legislation in public areas will likely cause a reduction of SHS exposure even at home. However, as noted by Haw and Gruer (2007) and Moore, et al (2015) extending legislation to control tobacco smoking within private homes in Bulawayo will likely be ineffective or unacceptable. Enforcing such legislation would be a mammoth task as it would be difficult for law enforcement agents to carry out domiciliary visits to monitor the compliance of such a law. What is perhaps needed more are behaviour change programs that will compel tobacco smokers to voluntarily give up the practice of smoking tobacco at home.

Almost 60% of the respondents had never heard any health worker educating non-smokers about the dangers of SHS. In addition, almost three quarters of the respondents had never seen a poster or pamphlet on SHS or they had last seen one in a period more than 4 weeks from the survey. Low or inadequate coverage of SHS issues in the media could also be contributing to the established prevalence of SHS exposure within the home. More than 50% of the respondents had never seen an article in the newspapers circulating in Bulawayo on the dangers of SHS. A further 35.1% had last seen a newspaper's article on SHS danger more than 4 weeks from the survey. This indicates that there was inactive health education

and media influence in Bulawayo on dangers of SHS, especially at home. Though, health education and media influence were found not to be a statistically significant predictor of SHS at home, their influence can never be downplayed. Practical actions have demonstrated the effectiveness of media use in reducing SHS exposure at home. Tim and van Walbeek (2013) after their study on the importance of media coverage in tobacco control in Namibia, argue that the media can play an important role in tobacco control. They suggest that the media can highlight some tobacco control issues such as SHS exposure thus potentially raising awareness to the dangers of SHS. A media campaign carried out in Australia (New South Wales) in 2005 to increase awareness of the health effects of SHS on children among parents and caregivers resulted in a 26% percentage point increase in smoke-free homes from 73% compared to 46.9% which was the baseline.

The findings of this study indicate that the right attitude towards tobacco control activities does not translate to the right tobacco control practices and actions. In the study, 66.8% thought it was right for people to be arrested for smoking tobacco in public and 86.2% indicated that smokers should not be allowed to smoke in the presence of children and non-smoking adults. It seems plausible to think that the 86.2% would translate their feelings into action and prohibit smoking within their homes. Yet, this was not the case in Bulawayo.

5.5 LIMITATIONS OF THE STUDY

The findings in this study are subject to some limitations and these will be briefly delineated here.

This study relied on self-report by respondents. There could have been under or over reporting by the respondents. Measurement of biomarkers such as cotinine as well as directly measuring tobacco combustion products in the air are some of the methods that have been used to verify self-reported exposure (Haw & Gruer, 2007; WHO, 2010b). However, due to the exorbitant cost of direct measurements of SHS exposure, the questionnaire was the most suitable tool to establish SHS exposure in Bulawayo and it has been used extensively in other SHS exposure measurement studies (Avila-Tang et al 2012; Haw & Gruer, 2007, Perez-Rios et al, 2012).

The other limitation associated with this study is that SHS exposure prevalence was established for settings such as the home, public transportation, educational, health and food premises and due to differences in characteristics of settings, it cannot be generalised for settings which were not studied such as factories and entertainment premises.

5.6 CONCLUSIONS

In this section, the conclusions arrived at for each of the study objectives will be presented. Conclusions reached under the objective which sought to determine the prevalence of SHS exposure among adults in Bulawayo will be presented first and thereafter those under the objective that sought to establish the factors contributing to the established prevalence will be presented.

OBJECTIVE 1: TO DETERMINE THE PREVALENCE OF SECOND HAND SMOKE EXPOSURE AMONG ADULTS IN BULAWAYO, ZIMBABWE

SHS exposure among adults in Bulawayo was high. Nearly a quarter (22%) of non-smoking adults were exposed to SHS within their homes and this illustrates the fact that the home is one of the key settings where SHS exposure occurs. Non-smoking adults were exposed to SHS even in premises where they were afforded protection from SHS exposure by law. In terms of the national tobacco control legislation smoking within educational premises, health facilities and public transportation was prohibited yet 42.9%, 26.3% and 40.9% of the residents were exposed to SHS in those settings respectively. This study highlighted that SHS exposure is not only a problem of cities in developed countries but that it is a global problem affecting non-smoking adults residing in both developed and developing countries.

Gender, age and marital status had an effect on the likelihood of an adult being exposed to SHS at home and in educational premises. This phenomenon was not limited to Bulawayo only as it had been reported in other studies (Pereira et al, 2013; Abdullah et al, 2014; Morrow & Barraclough, 2010). Whilst other studies (Homa et al, 2015; Nigeria, 2012; WHO, 2012) reported an association between SHS exposure at home and educational qualification, in this study that association was found to be insignificant ($p=0.387$). It suffices to conclude that in Bulawayo educational attainment in adults was not significantly associated with home SHS exposure. The same can be said for religion, as this study did not find a significant association between religion and SHS exposure at home.

In food premises in Bulawayo, legislation provided for the creation of smoking zones of up to one fifth of the sitting area yet this study established that in spite of the creation of smoking and non-smoking zones, 36.8% of non-smokers were exposed to SHS exposure in food premises. This study validates what has been reported elsewhere (Lambert & Donley, 2013; WHO, 2013) that the creation of smoking zones in food premises offers no safety to non-smokers as tobacco smoke can permeate from the smoking zone to the non-smoking zone.

SHS exposure in Bulawayo was not only limited to the home, public transportations, educational, health and food premises but it was also prevalent in other public settings such as streets, liquor premises, termini and public toilets.

OBJECTIVE 2: TO ESTABLISH FACTORS CONTRIBUTING TO THE PREVALENCE OF SECOND HAND SMOKE EXPOSURE AMONG ADULTS IN THE CITY OF BULAWAYO, ZIMBABWE.

Studies done elsewhere have identified a number of factors that contribute to the prevalence of SHS exposure. In Bulawayo residents had inadequate knowledge of health effects of SHS and the tobacco control legislation. This gap in the knowledge of residents on SHS could be contributing to SHS exposure prevalence in Bulawayo.

This study established that enforcement of tobacco control laws was weak. As noted by Drope (2011) tobacco control laws are available in a number of African countries but they are not being enforced. In places where legislation has been actively enforced SHS exposure has been reduced (Callinan et al, 2010, Haw & Gruer, 2007). It can therefore, be concluded that in Bulawayo weak enforcement of tobacco control legislation could be contributing to SHS exposure prevalence in public places. Furthermore, it was noted that the national tobacco control legislation provides for the creation of smoking zones in food premises yet it has been scientifically proven that designation of smoking zones within the same space as the non-smoking zone is not effective in preventing SHS exposure to non-smokers. This provision of a fallacious sense of protection to non-smokers within food premises could be contributing to SHS prevalence.

The majority of respondents in this study had a positive attitude towards tobacco control, yet a significant proportion of the respondents were exposed to SHS in various places. This persuades the researcher to conclude that a positive attitude to tobacco control does not translate to practices that will protect the individual non-smoker to SHS exposure neither is it significantly associated with home SHS exposure.

Health education and positive media influence are important tools in tobacco control activities (Abdullah et al, 2014; Tam & van Welbeek, 2013) yet in Bulawayo there was neither active health education programs conducted by health authorities nor positive media reporting. It is therefore, logical to conclude that health workers and the media in Bulawayo were not prioritising educating non-smokers on the dangers of SHS and this could be contributing to prevalence of SHS exposure in Bulawayo.

5.7 RECOMMENDATIONS

The following recommendations to reduce SHS exposure in Bulawayo are hereby made based on the study findings:

1. The City of Bulawayo Health Services Department should either by itself or through partnerships with interested organisations, raise awareness among the public about the detrimental effects of SHS. The awareness programs should be age, gender and culturally sensitive since these parameters have an important role in SHS exposure. The use of various media such as television, radio, billboards and posters should be considered so that the penetration of tobacco control messages can be improved.
2. Health Promotion Officers as well as Community Health Workers can incorporate tobacco control lessons in the health education sessions that they regularly offer to the community.
3. Tobacco control seminars for owners and managers of public premises such as schools, hospitals, public transport and food premises should be conducted regularly to raise knowledge levels on tobacco control legislation and harmful effects of SHS.
4. The City of Bulawayo Health Services Department should enlist the media and civil society in the fight against SHS exposure so that these institutions can act as 'watchdogs' for non-smokers especially for the vulnerable groups such as women and children.
5. Enforcement of tobacco control activities should be strengthened. Zimbabwe Republic Police and the municipal Environmental Health Officers should engage in visible and effective enforcement through mainstreaming of tobacco control enforcement in their routine patrol/inspection activities.
6. The Public Health (Control of Tobacco) regulations, 2002 should be revised to reflect the latest scientific advances in tobacco control and specifically to render public places 100% free from tobacco smoke through among other measures, abolishment of smoking zones in public premises.
7. Further research should be conducted to establish the burden of disease accruing in Bulawayo from the reported SHS exposure prevalence. Research should also be conducted to better understand why authorities in key institutions such as education and

health are failing to protect non-smokers from SHS as well as to establish prevalence in workplaces and other settings reported in this study where SHS exposure has reportedly been encountered.

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APPENDIX A: Questionnaire (English)

QUESTIONNAIRE

Dear Respondent

Thank you for agreeing to be part of this study. You are kindly requested to answer all questions as honestly as it can be. There is no right or wrong answer. Do not write your name anywhere. Your responses are going to be treated with utmost confidentiality.

1. Age 18-24 25-34 35-44
 45-54 55-64 65 and above

2. Sex Male Female

3. Highest Educational level attained

Primary Secondary College/University

4. Religion Traditionalist
 Christianity
 Muslim
 Other *kindly state it here.....*
 I don't have a religion

5. Marital status Never married Married/Living with a partner
 Widowed Divorced

If you are not married or not presently living with a partner go to question 7

6. Does your spouse/partner smoke Yes No

7. How many people in your home are smokers? _____

If there are zero people who smoke in your home kindly skip question 8 and go to question 9

8. If there are one or more people who smoke in your home, how often do they smoke in your presence?

- 1 -30 minutes a day
- 31- 60 minutes a day
- More than 1 hour – 2 hours a day
- More than 2 hours a day

9. In the last 30 days did you smell tobacco smoke in the bus, kombi, train or any other mode of transportation you were travelling in

- Yes No

10. In the last 30 days did you smell tobacco in a clinic, hospital or surgery you went to.

- I did not visit a clinic, hospital or surgery in the last 30 days
- Yes
- No

11. In the last 30 days did you smell tobacco in a school or college you went to?

- I was never in a school or college in the last 30 days
- Yes
- No

12. In the last 30 days did you smell any tobacco smoke inside the food premises you went to?

- I was never in a restaurant or takeaway in the last 30 days
- Yes
- No

13. In the food premises you visited in the last 30 days was there a clearly marked "NO SMOKING ZONE"

- I was never in a restaurant or takeaway in the last 30 days
- Yes, there was a clearly marked no smoking zone in a few of the premises
- Yes, there was a clearly marked no smoking zone in most of the premises
- No, there was no clearly marked no smoking zone in all the premises

14. Which are the other public places where people have smoked in your presence?

- i.....
- ii.....
- iii.....
- iv.....

15. Smoking is dangerous to human health

- Yes
- Am not sure
- No

16. A person who does not smoke can get cancer from breathing tobacco smoke puffed by a smoker.

- Yes
- Am not sure
- No

17. Unborn babies can be affected by second hand smoke

Yes

Am not sure

No

18. Can a person be arrested for smoking tobacco within school grounds?

Yes

Am not sure

No

19. Can a person be arrested for smoking tobacco in a hospital?

Yes

Am not sure

No

20. Have you ever seen anyone being arrested for smoking in a public place?

Yes, I have seen someone

No, I have never seen anyone

21. Is it right to arrest people who smoke in public?

Yes

Am not sure

No

22. What do you think of people who smoke in your presence?

- There is nothing that can be done to them, it's their right
- They should not be allowed to smoke around children
- They should not be allowed to smoke around adults
- They should not be allowed to smoke around both children and adults

23. When was the last time you heard a health worker giving a lesson on the dangers of tobacco smoke to non smokers?

- I have never heard any health worker giving such a lesson
- Last week 2- 4 weeks ago
- More than 1month to 3 months ago more than 3months ago

24. When was the last time you read or saw a pamphlet or poster on dangers of tobacco smoke to non-smokers?

- I have never read or seen any pamphlet or poster on dangers of tobacco smoke
- Last week 2- 4 weeks ago
- More than 1month to 3 months ago more than 3 months ago

25. When was the last time you read or saw a newspaper with a story on dangers of second hand smoking?

- I have never read any newspaper with a story on dangers of tobacco smoke
- Last week 2- 4 weeks ago
- More than 1month to 3 months ago more than 3 months ago

Thank you

APPENDIX B: Questionnaire (isiNdebele)

IMBUZO

Kuwe ophatheka kuloluphenyo

Ngiyabonga ukuba uvume ukuba yingxenye yaloluphenyo. Uyacelwa ukuba uphendule yonke imbuzo ngeqiniso. Akula mpendulo okuthiwa iqondile kumbe ayiqondanga. Ungalobi ibizo lakho ndawo. Impendulo zakho zizahlonitshwa okumangalisayo azisoze zivezwe.

1. Uleminyaka yokuzalwa emingaki

18-24

25-34

35-44

45-54

55-64

65 and above

2. Ubulili

iSilisa

iSifazane

3. Yiliphi ibanga lemfundo owacina kulo

Prayimari

Sekhondari

eKholeji / eUnivesithi

4. Inkolo yakho

Ezomdabuko

nginguMkrestu

Mozilemu

Enye engabaliswanga phezulu itsho lapha.....

Angila nkolo

5. Utshadile?

Angikaze ngitshade

Ngitshadile/ Kulomuntu esithandanayo esihlala sonke

Ngatshiywa ngumkami

Ngehlukana lomkami

Nxa ungakaze uthathe kumbe wende njalo uma ungahlali lomuntu elithandanayo yeqa lo mbuzo uyeko wesikhombisa

6. Umkakho kumbe isithandwa sakho ohlala laso siyabhema na

Yebo

Hatshi

7. Bangaki ohlala labo ababhemayo _____

Uma unghlali lomuntu obhemayo yeqa umbuzo olandelayo uye kowesitshiya ngalolunye (9)

8. Nxa kulomuntu oyedwa kumbe abanengi ohlala labo ababhemayo, bavame ukubhema imizuzu emingaki lindawonye?

Imizuzu eyi 1 kusiya kwengu 30 ngelanga

Imizuzu engu 31 kusiya kwengu 60 ngelanga

Ihola elilodwa kusiya kwamabili ngelanga

Amahola edlula amabili nge langa

9. Kumalanga angamatshumi amathathu (30 days) edluleyo uke wezwa igwayi emoteni, esitimeleni kumbe kuyini obe ukugadile na?

Yebo

Hatshi

10. Kumalanga angamatshumi amathathu adlulileyo (30 days) uke wezwa kunuka igwayi esibhedlela kumbe ekilnika oke wafika kuyo na?

Angizange ngiye esibhedlela loba ekilnika emalangeneni angamatshume adlulileyo

Yebo

Hatshi

11. Kumalanga angamatshumi amathathu adlulileyo uke wezwa igwayi linuka esikolo kumbe ekholitshini oke wafika khona na?

Angizange ngibe sesikolo kumbe ekolitshini ngensuku ezibalwayo

Yebo

Hatshi

12. Ngensuku ezingamatshumi amathathu ezidlulileyo uke wezwa kunuka igwayi endaweni zokudlela okewazifika na?

Angizange ngibe endaweni okudliwa (amarestuwarenti) khona ngensuku ezibalwayo

Yebo

Hatshi

13. Endaweni okudliwa khona ozifike amalanga angamatshumi amathathu adluleyo kwakulendawo ephawuliweyo ngokubalulekileyo ukuba akubhenyelwa khona na (NO SMOKING ZONE)

Angizange ngibe sendaweni okudliwa (amarestuwarenti) khona ngensuku ezibalwayo

Yebo, kwakulendawo ephawuliweyo sobala ukuba kungabhenyelwa khona endaweni ezilutshwana engafika kuzo

Yebo, kwakulendawo ephawuliweyo sobala ukuba kungabhenyelwa khona endaweni ezinengi engafika kuzo

Hatshi, kwakungela ndawo eziphawuliweyo ukuba kungabhenyelwa khona kuzo zonke indawo engazivakatshelayo

14. Yiziphi ezinye indawo zomphakathi lapho abantu asebebheme igwayi lawe ukhona?

i.....

ii.....

iii.....

iv.....

15. Ukubhema kuyingozi empilweni yomuntu na?

Yebo

Angila qiniso ngalokhu

Hatshi

16. Umuntu ongabhemiyo engathola imvukuzane ngokuphefumula intuthu yegwayi evela kobhemayo na?

Yebo

Angila qiniso ngalokhu

Hatshi

17. Abantwana abangakazalwa bengaphambaniswa yintuthu yegwayi besasesiswini na?

Yebo

Angila qiniso ngalokhu

Hatshi

18. Umuntu engabotshelwa ukubhemela igwayi emagumeni esikolo na?

Yebo

Angila qiniso ngalokhu

Hatshi

19. Umuntu engabotshelwa ukubhemela igwayi emagumeni esibhedlela na?

Yebo

Angila qiniso ngalokhu

Hatshi

20. Usuke wabona umuntu ebotshelwa ukubhemela emphakathini

Yebo

Hatshi

21. Kuqondile na ukubophela abantu ukubhema emphakathini

Yebo

Angilaqiniso lalokhu

Hatshi

22. Ucabangani ngabantu ababhema igwayi beseduze lawe

- Akulanto engingayenza lilungelo labo
- Akumelanga bevunyelwe ukubhema duze labantwana
- Akumelanga bevunyelwe ukubhema duze labantu abadala
- Akumelanga bevunyelwe ukubhema duze labantu abadala kumbe abantwana

23. Uciné nini ukuzwa abezempila kahle befundisa ngezingozi zentuthu yegwayi kulabo abangabhemiyo

- Angikaze ngizwe befundisa lokho
- Iviki eliphelileyo
- Amaviki amabili kusiya kwamane adlulileyo
- Inyanga eyodwa kusiya kwezintathu ezidluleyo
- Inyanga ezedlula ezintathu ezedluleyo

24. Uciné nini ukubala kumbe ukubona amaphepha lamagwaliba ezempilakahle akhuluma ngengozi yentuthu yegwayi kwabangabhemiyo na?

- Angikaze ngiwabone amaphepha kumbe amagwaliba anjalo
- Iviki eliphelileyo
- Amaviki amabili kusiya kwamane adlulileyo
- Inyanga eyodwa kusiya kwezintathu ezidluleyo
- Inyanga ezedlula ezintathu ezedluleyo

25. Uciné nini ukubala kumbe ukubona iphephandaba elilendaba ekhuluma ngengozi zentuthu ye gwayi kwabangabhemiyo na?

- Angikaze ngiwabone amaphepha kumbe amagwaliba anjalo
- Iviki eliphelileyo
- Amaviki amabili kusiya kwamane adlulileyo
- Inyanga eyodwa kusiya kwezintathu ezidluleyo
- Inyanga ezedlula ezintathu ezedluleyo

Siyabonga

APPENDIX D: Consent form (isiNdebele)

UNIVERSITY OF LIMPOPO (Medunsa Campus) NDEBELE CONSENT FORM

Ibizo lophenyo:

**UKUVAMA KOKUPHEFUMULWA KWENTUTHU YEGWAYI NGABANTU
ABADALA ABANGABHEMIYO KO BULAWAYO EZIMBABWE**

Sengibalile injongo yaloluphenyo njalo ngiphiwe ithuba lokubiza imbuzo ngengingakuzwisanga lelokucabangisisa ngaloludaba. Injongo zaloluphenyo zicacile kimi njalo angibanjwanga ngamandla ukuphatheka kuloluphenyo.

Ngiyazwisisa ukuba ukuphatheka kuloluphenyo yikukhetha kwami lokuba ngingatshiya iloba yisiphi isikhathi ngingaphanga sizatho futhi.

Ngiyazi ukuba loluphenyo luvunywe ngabe Medunsa Campus Research and Ethics (MREC), University of Limpopo/ Dr Georange Mukhari Hospital. Ngiyakuzwisisa ukuba imphumela yalolu phenyo lungasetshenziswa kweze sayensi njalo imphumela ingancitshilelwa. Lokho ngiyakuvuma nxa imfihlo yami ingasoze isakazwe.

Ngilapha ngipha imvumo yokuphatheka kulolu phenyo.

.....
Ibizo lozaphatheka kuloluphenyo

.....
Isignetsha yakhe.

.....
Indawo.

.....
Ilanga

.....
Umfakazi

Okutshiwo ngumphenyi

Ngivezile okuphathelelani lalolu phenyo ngokubhaliweyo/ ngokukhuluma

Ngizimisile ukuphendula imbuzo engavela ephathelele laloluphenyo

Ngizalandela lokhe okuvunyiweyo ngoqhuba loluphenyo

.....
Ibizo lika mphenyi

.....
Isignetsha

.....
Ilanga

.....
Indawo

*Ncitsha okungaphathelelani lawe.

ANNEXURE E: Ethics Committee clearance

UNIVERSITY OF LIMPOPO
Medunsa Campus



MEDUNSA RESEARCH & ETHICS COMMITTEE

CLEARANCE CERTIFICATE

MEETING: 07/2014
PROJECT NUMBER: MREC/HS/272/2014: PG
PROJECT:
Title: Prevalence of second hand smoke exposure among adults in Bulawayo, Zimbabwe
Researcher: Mr N Ndlovu
Supervisor: Prof EF Mbajjorgu
Co-supervisor: Mr MP Kekana
Department: Medical Science, Public Health & Health Promotion
Degree: MPH

DECISION OF THE COMMITTEE:

MREC approved the project.

DATE: 04 September 2014

pp. 

PROF GA OGUNBANJO
CHAIRPERSON MREC



The Medunsa Research Ethics Committee (MREC) for Health Research is registered with the US Department of Health and Human Services as an International Organisation (IORG0004319), as an Institutional Review Board (IRB00005122), and functions under a Federal Wide Assurance (FWA00009419)
Expiry date: 11 October 2016

- Note:**
- i) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.
 - ii) The budget for the research will be considered separately from the protocol. PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

Finding Solutions for Africa



APPENDIX F: Study approval letter from the City of Bulawayo



City of Bulawayo

The Town Clerk's Department
Municipal Buildings
Fife Street
P.O. Box 591
Bulawayo

All Communications
to be addressed to the
Town Clerk

Tel: (263-9) 75011
Fax: (263-) 69701

Our Reference: TNB/GN. N6A/103

04 April 2014

Nkanyiso Ndlovu
C/o Health Services Department
BULAWAYO

Dear Sir/Madam

**RE: REQUEST FOR PERMISSION TO CARRY OUT A RESEARCH WITHIN
BULAWAYO CITY COUNCIL PREMISES ON PREVALENCE OF SECOND HAND
SMOKING IN THE CITY OF BULAWAYO**

Please note that there are no objections to your request to carry out research within Bulawayo City Council premises subject to the following conditions:

- a) You should submit a copy of your research findings including the executive summary after such an exercise.
- b) Council should be indemnified against any accident/injury, which may occur during this period.

Accordingly you may approach any of Council's Service Departments as appropriate for assistance.

Yours faithfully


TOWN CLERK

ANNEXURE G: Language editor's certificate



**FACULTY OF ARTS AND EDUCATION
DEPARTMENT OF LANGUAGES AND LITERATURE**

No. 44 Anchor House
Cnr Fort St & 12th Avenue
Bulawayo
Zimbabwe
+263-884054/55

28 May 2015

To Whom It May Concern

**RE: PROOFREADING CONFIRMATION FOR NKANYISO NDLOVU
DISSERTATION**

This note serves to confirm that the mini-dissertation by the above mentioned candidate, titled '*Prevalence of second hand smoke exposure among adults in Bulawayo, Zimbabwe*' for submission to the University of Limpopo for the degree of Master of Public Health, was proofread in the Department and recommendations made. The effecting of the recommendations remained exclusively with the candidate at the finalisation of the document.

Thank you

A handwritten signature in black ink, appearing to read 'N. Sibanda'.

Nhlanhla Sibanda (Mr)
(Lecturer- English & Communication Studies)
(MA English, BA Hons English, Dip. Ed, Dip in Ministry)