WATER PIPE TOBACCO SMOKING AMONG YOUTH: A STUDY OF SOCIAL DETERMINANTS, ATTITUDES AND PERCEPTIONS OF SMOKERS IN KINONDONI MUNICIPALITY, DAR ES SALAAM REGION

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By

Moses Stephen, BA

A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the Degree of Master of Public Health of Muhimbili University of Health and Allied Sciences.

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CERTIFICATION

The undersigned certify that he has read and hereby recommend for acceptance by the Muhimbili University of Health and Allied Sciences a dissertation titled **Water Pipe Tobacco Smoking among youth: A study of social determinants, attitudes and perceptions of smokers in Kinondoni Municipality, Dar es Salaam Region** in (partial) fulfillment of the requirements for the degree of master of public health of Muhimbili University of Health and Allied Sciences.

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Dr. Mangi J. Ezekiel

(Supervisor)

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Date

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DEDICATION

I dedicate this work to my father, Stephen M. Jullah and my mother, Elizabeth S. Mtatuu.

ABSTRACT

Background: The prevalence of water pipe tobacco smoking in developing nations like Tanzania and worldwide is increasing. Globalization and migration which have been acting like powerful engines in the spread and the rise of water pipe smoking have eventually brought the dangerous habit in Tanzania which is popularly known as *Shisha*. Since Water pipe smoking is emerging as serious problem of public health importance globally, there is dire need to study critically its positive predictors, patterns of smoking and health effects and disseminate the findings to guide formulation of interventions to address this emerging global public health issue.

Objective: The objective of this study was to gain an in depth understand of the factors related to water pipe tobacco among the youth of Kinondoni municipality. That is, to study how social determinants, local beliefs, attitudes, perceptions and the attached social, cultural and functional meanings of that type of smoking are influencing the initiation (the uptake),maintenance and even the cessation (quitting) of the water pipe tobacco smoking.

Methodology: The type of study is Phenomenology and data from study participants was collected through semi structured interviews. The participants (interviewees) were picked by using one of the types of Purposive Sampling which is known as Maximum Variation Sampling. The collected data was analyzed using constant comparative analysis which is a process whereby data collection and analysis are done on ongoing basis.

Findings: A total of 44 (32 males and 12 females) study participants were interviewed. A majority, 69% percent of participants were below 25 years .Almost a third of these participants were students, very few participants have permanent employment and majority are either unemployed or self employed with small business activities. Again, the majority have secondary school education and low income individuals. The dominant themes which emerged from the interviews were peer pressure, availability, affordability, fashionable trend, relaxation, addiction, lack of knowledge, health problems, cultural and social context, and the water pipe tobacco smoking in relation to Cigarettes and Marijuana smoking.

The local beliefs related to water pipe tobacco among young smokers are centered on addiction, contents, harmfulness and the danger of the water pipe tobacco vis-à-vis Cigarette and Marijuana smoking. In turn beliefs, perceptions and misconceptions are responsible in informing the positive and favorable attitudes of young smokers towards water pipe tobacco.

Social determinants in terms of education level, monthly income, employment status, occupation and social relations seem to have a direct influence in smoking behavior. The water pipe tobacco smoking behavior is attached to various social, cultural and functional meanings.

Conclusion and Recommendations: The smoking of water pipe tobacco or *Shisha* is increasingly becoming popular among young men and young women in most cities and major towns of the country. The reasons for the growing popularity of this type of tobacco smoking are many but prominent among them are misguided beliefs, attitudes, perceptions, poor knowledge of the contents and health effects of *Shisha* smoking, the rising availability and economic accessibility of the water pipe tobacco, a lenient tobacco control policy and lack of health information. Before water pipe tobacco smoking can become a serious problem of public health importance in the country, evidence-based public health and policy strategies are required to equip the youth and the whole public to make informed decisions about water pipe tobacco smoking.

The recommended measures are formulation of comprehensive tobacco control policy, high taxation on *Shisha* products, graphic health warnings on water pipes and water pipe tobacco and implementing FCTC policies and strategies. To address the issues of knowledge, beliefs, attitudes and perceptions, educational interventions are required. And lastly, more studies are required on water pipe tobacco smoking especially epidemiological studies on the health problems experienced by the water pipe tobacco smokers and country wide quantitative studies to establish the estimated number of smokers and the gravity of the situation.

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LIST OF ABBREVIATIONS

FCTC	Framework Convention on Tobacco Control
MUHAS	Muhimbili University of Health and Allied Sciences
NIMR	National Institute for Medical Research
UN	United Nations
WHO	World Health Organization
CDC	Centre for Disease Control and Prevention

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DEFINITIONS OF KEY TERMS

- Arghileh – A type of water pipe used in the Eastern Mediterranean Region (Shihadeh,2003)
- Attitude- A person's negative or positive judgment of a behavior (Ajzen& Fishbein,1980)
- Behavioral beliefs – the beliefs that underlie a person's attitude (toward a behavior) (Ajzen&Fishben, 1980a).
- Carbon monoxide - An odourless, colorless, toxic gas found in tobacco smoke
- Goza – An apparatus used to smoke tobacco, similar in structure to water pipe (Khater, Abd El-Aziz, Al-Sewaidan,& Chaouachi,2008)
- Hookah – An apparatus or ancient pipe traditionally used in Africa and Asia (Chaouachi,2009)
- Hubble Bubble– A method of smoking through a water pipe, whereby, the sound of air flowing through the water bowl produces a sound described as such
- Maasel(Mo'assel) - Also known as tobamel (tob stands for tobacco and mel for honey, in Latin). A mixture of about 30% tobacco and 70% molasses/honey/glucose syrup plus glycerol and essences (Chaouachi,2009)
- Narghile – A Persian/Iranian and Turkish word to describe a waterpipe or apparatus, typically based on a coconut as the vessel (Chaouachi,2009)
- Shisha – Of Persian origin, bottle (recipient) of water made of glass with a typical flask/via form (Chaouachi,2009)
- Waterpipe – also referred to as hookah or shisha has a mouthpiece, hose, water bowl, body and head that is filled with tobacco and heated with charcoal (Eissenberg, et al., 2008).

CHAPTER ONE

1.0 INTRODUCTION

Tobacco is a preventable cause of morbidity and mortality across the globe. Low and middle-income countries are most severely affected. Estimates show that tobacco related deaths are expected to rise from 5.4 million in 2005 to 6.4 million in 2015 and 8.3 million in 2030 (Mathers and Loncar,2006). This prediction highlights the need to study the trends and patterns of tobacco usage in different forms as well as to come up with effective control and prevention strategies for these developing countries (Maziak et al., 2006). The world Health Organization warns that if current smoking patterns continue, it will cause some 10 million deaths yearly by the year 2020 (WHO, 2005).

Almost 70% of these premature deaths will be in developing countries, one third (250 million) of which will be children (WHO, 1999) making tobacco uses a global epidemic. Between 1980 and 2012,the number of adults who smoke increased from 721 to nearly 1 billion, according to the study published in Journal of the American Medical Association early this year (2014).The number of cigarettes smoked globally jumped from about 5 trillion to 6.25 trillion (The Seattle Times, January 2014).

Most of the tobacco that is consumed throughout the world is in the form of manufactured cigarettes, but tobacco is also smoked in other products, such as cigars, cigarillos, water pipes, Kreteks (clove cigarettes), Bidis (tobacco in a *tendu* or *temburni* leaf that is tied with a cotton thread), and papirosy (cardboard tube-tipped cigarettes)(Eriksen, Mackay , Ross ,2012). Water pipes are commonly used in Middle Eastern countries and some Asian countries. Kreteks are the dominant tobacco product consumed in Indonesia and Bidis are smoked widely in the Indian subcontinent. Papirosy are smoked in Russia. Many types of smokeless tobacco products exist. Various forms of loose – leaf chewed tobacco are commonly consumed in the Indian subcontinent. For example, betel quid is made of tobacco, areca nut, slaked lime and flavoring agents, all of which are wrapped in a betel leaf. Snuff (finely chopped tobacco) is used in many countries and in some is branded with the names of leading cigarette varieties (Giovino et al., 2012).

In 2011, tobacco control was identified as the "most urgent and immediate priority" intervention to reduce non communicable disease (Beaglehole et al.,2011) .The United Nations (UN) high level meeting on non-communicable diseases echoed the urgency of controlling tobacco use. To reduce worldwide smoking prevalence by 30% by 2025, countries are exhorted to fully implement Framework Convention on Tobacco Control (FCTC) (WHO, 2005). WHO defines optimum policies on smoke-free air, cessation, warning labels, mass media, marketing bans and taxation, which, if fully implemented worldwide would have an enormous effect on reduction of premature mortality (WHO, 2011). Although 1.1 billion people have been covered by the adoption of the most effective tobacco-control policies since 2008, 83% of the world's population is not covered by two or more of these policies (WHO, 2011).

As already highlighted above, tobacco is used in different forms and among these *Shisha* smoking is gaining immense popularity mainly because of its youth appeal (Maziak, 2006; Rastam, 2004; Kandela, 2000). Generally, *Shisha* which is also known as a water pipe consists of head, body, hose and water bowl. Tobacco is the main component of *Shisha* smoking placed in the head and often covered in aluminum foil on top of which some burning charcoal is placed. Water should fill half the water bowl, submerging a tube through which smoke enters, but not the hose-connected tube through which the smoke leaves. Thus during inhalation the smoke passes the submerged tube into the hose-connected tube making its way to the smoker. Though this practice is centuries old, it has recently increased in popularity among many Arab countries and generally across the world (Maziak et al., 2004; Rastam , 2004).It's now commonly practiced in commercial cafes, restaurants and even homes.

Most products smoked in the water pipe contain tobacco, but some do not (herbal Shisha).So there is mainly two types of Water pipes, that is tobacco *Shisha* (tobacco water pipe) and herbal *Shisha*. The latter is marketed to health-conscious users as a healthier alternative, but recent research show that herbal *Shisha* can be as harmful to smoke as *Shisha* tobacco (Professional Briefing on Shisha, October 2013) .When tobacco is used it is sweetened with

fruit syrups, molasses and other flavorings. Certain perceptions, attitudes, beliefs and social determinants have been shown to be closely associated with water pipe smoking behavior.

Social determinants, according to numerous studies are closely associated with smoking across all ages and gender. Peer influence or pressure, familial social norms and customs, parental smoking, smoking among older siblings and social acceptability may contribute to initiation and continuation of smoking water pipe tobacco in youth and young adults. Approval of smoking by friends, parents, and other key persons, for example friends, is likely to increase the probability of smoking through the imitation of these role models (Karimy et al., 2012). There is also a question of association between smoking and socio economic status, according to US Surgeon General report of 2012, the socioeconomic status of youth is derived from such measures as parental income or occupation, parental education and access to resources. The Surgeon General report continue to explain that population-based studies typically use indicators of socio economic (e.g., education or income) or self reported measures (e.g., perceived social class or wealth relative to others) or both, to measure socio economic status.

Various studies worldwide have documented the association between socioeconomic status and smoking among adults and youth. Low socioeconomic status has been associated with a high prevalence of smoking in population based studies in France (Bauman et al., 2007), Germany (Haustein, 2006), India (Neufeld et al., 2005; Thankappan and Thresia 2007; Mathur et al., 2008), and the United States (Flint and Novotny, 1997). Smoking is linked to social deprivation. People who live in deprived areas are at greater risk of starting to smoke, likely to be more heavily addicted, and have lower chances of quitting successfully, compared with more affluent smokers. Long term smoking is closely correlated with inequality and social exclusion, with children from low income backgrounds most likely to be smokers in adulthood (Muller, 2007). A study carried out in Ukraine revealed that men of low income category were more likely to initiate tobacco smoking earlier (Andreeva et al., 2007). But some studies have also associated high socioeconomic status with water pipe smoking; Dugas et al. (2010) in their study found out that, not living with parents and higher annual household income were associated with water pipe use. This, according to Dugas and colleagues, supports the previous

finding that higher weekly disposable income was associated with water pie use (Smith-Simone et al., 2008). Anjum et al. (2008) study showed that the highest percentage of *Shisha* smoking was observed among college students with higher socioeconomic status. Water pipe users may represent a more privileged group of young people with a leisure time, resources, and opportunities to use water pipes (Dugas et al., 2010).

Water pipe tobacco smoking is growing in popularity across the globe according to health researchers and perceptions of smokers are reported to be one of the leading factors in this growth. According to Knishkowy and Amitai (2005) numerous factors may underlie the growing popularity of water pipes including cost , easy access, appeal of the social interaction that accompanies use (Gatrad et al.,2007) commercialization by the media(Maziak, 2008) availability of sweetened , flavored, and aromatic tobacco or maasel, which can mask the taste of tobacco (Ward et al.,2007) perceptions of low risk to health(Eissenberg et al.,2008) linked to the belief that the water filters the toxins from the smoke (Ward et al.,2007) the lack of public health warnings about the dangers of water pipe use (WHO,2006) and the perception that water pipe smoking is less addictive than cigarette smoking(Eissenberg et al.,2008). In a study done by Kakodhar and Bansal (2013) among youth smokers in Pune, India, majority (71-80%) of the participants consider hookah smoking to be less dangerous and less harmful compared to cigarette smoking and this consideration is similar to the perception of the hooker smokers globally (Smith-Simone et al.,2008; Aljarrah et al.,2009; Combrink et al.,2010;Dar Odeh et al.,2010; Jordon and Delenovo 2010;Al- Naggar and Saghir Fatma,2011).

Studies on attitudes of water pipe tobacco smokers have shown close associations between the perceptions, misconceptions, beliefs and knowledge of the current smokers and their attitudes towards smoking and quitting. Current smokers of water pipe tobacco normally were found to have more positive attitudes towards water pipe smoking compared to non smokers. Prior research on adolescent smoking behavior, for example, indicated more positive attitudes toward smoking and smokers tended to be related with an increased likelihood of smoking (Mallia and Hamilton, 2010). Knowledge, attitude and practice are related when it comes to

human behavior, so when people lack knowledge on the deleterious effects of water pipe tobacco smoking their attitudes became more positive towards smoking. Consistent with previous reports (WHO, 2005; Anjam et al., 2008; Jawid et al., 2008) most water pipe users believed that its use was neither as harmful nor as addictive as cigarettes. These perceptions of reduced risk may help explain why some individuals who do not smoke cigarette are willing to engage in water pipe smoking (Amin et al., 2010). But knowledge alone sometime is not enough in influencing attitude, Al Faris et al. (1994) pointed out that though many Saudi studies have shown a high level of knowledge about the hazards of smoking, that knowledge did not affect smoking behavior. In Syria and Pakistan, family attitudes towards water pipe smoking were mostly either neutral or positive, particularly compared to cigarette smoking(Hammal et al., 2008) (Jawaid et al., 2008). Three studies from Syria reported that family members are generally more tolerant or permissive of female relatives smoking water pipe than female relatives smoking cigarettes (Maziak et al., 2004).

In Tanzania, there is no literature on water pipe tobacco smoking but news reports from respected and credible newspapers have highlighted the increasing popularity of the habit among the youth. The investigative news reports further pointed out that, there is increasing number of joints selling water pipe tobacco popularly known in Dar es Salaam and other towns as *Shisha*.

Water pipe tobacco smoking has different names such Nargila, Narghile, Arghileh, Goza, Hubble-Bubble, water pipe, Hookah and *Shisha* in different countries. In this paper, the researcher has used water pipe to cover all these different names as recommended by World Health Organization (WHO, 2006). But is should also be noted that the words *Shisha* and Hookah have also been used occasionally due to their popularity in literature and in the country (Tanzania).

Despite the fact that the main burden of this epidemic is taking place in the developing countries, most research and management efforts addressed developed nations (Jha and Chaloupa, 2000). These researches also tend to focus on prevalent methods of tobacco use in these countries namely cigarettes and smokeless tobacco use, and in most instances did not

consider those prevalent in developing countries such as water pipe (Wart et al., 2005), despite the fact that as many as 100 million people use such method of tobacco use (Wolfram et al., 2003).

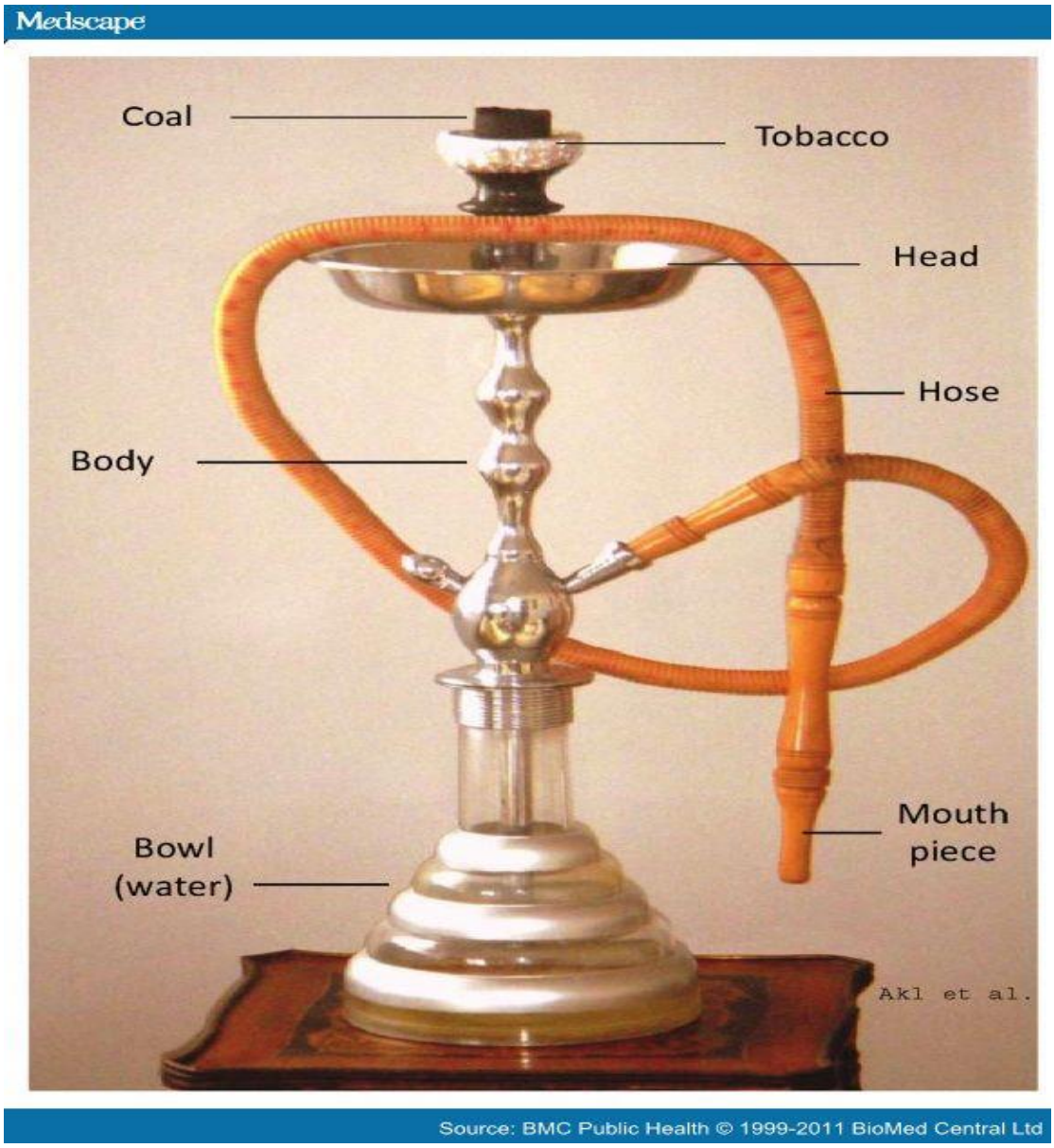


Figure 1: Annotated figure of a Water pipe tobacco smoking device and its main parts

1.1 LITERATURE REVIEW

Background:

Water pipe tobacco smoking is a centuries old habit. Its origin from one historical account suggested that it was invented in India by physician Hakim Abul Fath during the reign of Emperor Akbal as a less harmful method of tobacco use (Chattopadhyay, 2000). But some suggested that it was first used in South Africa, Persia, Ethiopia and other countries (www.sacrednarghile.com). It has been claimed that greater than 100 million people worldwide smoke water pipe (www.sacrednarghile.com). It has been a common practice in the Arabian Peninsula, Turkey, Pakistan, Bangladesh and China.

According to studies, water pipe or hookah pipe smoking has steadily increased among adolescents and young adults during the past two decades in Europe and North America, with recent reports of usage in Brazil, Korea, Australia and New Zealand (Aljarrah et al., 2009). This form of tobacco use is a significant contributor to the maintenance of high rates of tobacco use among youth and young adults especially university students, in effect negating the gains achieved by the global decline in overall cigarette smoking in recent years (Maziak,2010). The tsunami-like wave of Hookah pipe popularity has led to suggestions that Hookah pipe smoking represents the second major tobacco epidemic (Maziak, 2011).

Design of Water Pipes

Water pipes or Hookah pipes come in a variety of sizes, designs, colours and materials (Knishkowy and Amitai, 2005). Some have even been made into works of art by skilled craftsmen in India and the Middle East (Prokhorov et al., 2006). Despite minor variations that exist between different water pipes, the majority consist of the same basic components: a bowl, head, body, hose, mouth piece and a pipe (stem).

Tobacco, the primary component of water pipe smoking is placed in the head and often covered with perforated aluminum foil; burning charcoal is placed on top of the foil. **Water**

fills half the bowl, submerging a tube through which smoke enters, but not the hose-connected tube through which smoke leaves. Thus, an inhalation at one end of the hose produces a vacuum in the air filled space of the water bowl, causing smoke to pass through the water producing bubbles, into the hose-connected tube, and thence to the smoker (Vega, 2006). The water cools the smoke and partially filters out some of the tar and particulates contained within the smoke (Bacchus Network, 2007). The filtration process results in progressive brownish discoloration of water within the vase (bowl) as the smoking session proceeds, usually necessitating a change of water after each smoking session (Asotra,2005). Typical smoking sessions last between 45 and 50 minutes but may continue for several hours (Knishkowy and Amitai, 2005; Maziak et al., 2005).

Toxic constituents

The water pipe tobacco smoke has toxic constituents as documented by various studies. Studies using a smoking machine to test toxicant yields in the lab environments found that water pipe tobacco smoke contains carbon monoxide, polyhyrocarbons, formaldehyde, nitrogen, nitric acid, nicotine) (Rastam,et.,2004)(Shihadeh,saleh,2005) and other toxicants such as arsenic ,chromium, lead, and volatile aldhehydes (WHO, 2006).The nicotine content of white pipe tobacco has been reported as 2% to 4% vs. 1% to 3% for cigarettes. Carbon monoxide concentrations have been reported to be 0.34% to 1.40% for water pipe smoke and 0.41 for cigarette smoke (Maziak, et al., 2004). Water pipe smokers might absorb higher concentrations of these toxins because of the smoke itself, or smoking for several hours at a time and inhaling the moisturized, less irritating smoke more deeply (Maziak et al., 2004).

The smoke also contains combustion products of charcoal including carcinogenic polycyclic aromatic hydrocarbons and carbon monoxide (Monzer et al., 2008). Following the recent publication by the American Lung Association “An emerging Deadly Trend: Water pipe Tobacco Use” (American Lung Association, 2007) Mostafa Mohamed, Professor of Community Medicine in Cairo said, “Heat sources that are commonly used in *Shisha* pipes to burn the tobacco are likely to increase the health risks because they produce toxins on burning putting *Shisha* smokers and those around them at greater risk”. Dr Alan Shihadeh of the

American University in Beirut stated, “Every recent study has found that *Shisha* smoke contains large quantities of the chemicals that lead to heart disease, cancer, and addiction in *Shisha* smokers” (Shihadeh, 2003).

Health effects and risks

There is evidence to indicate both short term and long term effects of water pipe tobacco smoking resulting in the issuance of an advisory note by the World Health Organization in 2005. Health risks include, in the short term developing dependence and acute respiratory diseases and lung impairment (Maziak et al.,2004;WHO, 2005).Other more serious negative health outcomes include risk of developing cancers, including lung cancer and other chronic diseases such as cardiovascular and respiratory. During pregnancy, water pipe smoking can lead to low fetal birth weight (NuwayhidI et al., 1998). In addition exposure to second hand smoke from water pipe smoke poses a serious health risk to non smokers. Other health risks include the spread of infectious diseases, such as Tuberculosis, due to the sharing of the water pipe among smokers (WHO, 2005).

Even though several health hazards have been associated with water pipe smoking, the general population has not yet fully understood the associated risks (Kandela, 2000; Maziak, 2004). The health risks of water pipe remain largely unrecognized by the lay public (Maziak, 2008: Cobb, 2010). For example, a qualitative study in Syria reported people’s views of water pipe smoking as a pleasurable activity among friends with no regard to health consequences (Hammal et al., 2008).

Water pipe and tobacco regulations

The production of water pipe tobacco or *Shisha* is unregulated. Unlike cigarettes, *Shisha* packaging and accessories often have misleading and inaccurate content descriptions ,such as 0.5% or 0.05 nicotine, and 0% tar, or the charcoal is ‘free of chemicals’ or ‘100 natural’ . These may give users a false impression of safety (Maziak, 2011). There are no water pipe-specific health warning labels on *Shisha* tobacco products and related accessories which

comply with WHO guidelines on the packaging and labeling of tobacco products (Nakkash and Khalil, 2010).

Investigators examined a sample of 74 hookah (*Shisha*) tobacco packs from nine countries, including two sold in South Africa, and found that none complied with article 11 of the World Health Organization's Framework Convention on Tobacco Control (Nakkash and Khalil, 2010). Nearly 80% of the packs listed the content of tar as 0.0%, and nicotine between 0.05 and 0.5% (Nakkash and Khalil, 2010). These descriptors appear to be intentionally misleading (tar is only produced upon heating the tobacco, therefore the packaged tobacco does not technically contain any tar) and serve to conceal the potential risks of smoking hookah pipes (Martinasek, 2011).

Social determinants of water pipe tobacco smokers

Studies in Middle East, United states and elsewhere have shown a close association between water pipe tobacco smoking and social determinants of smokers. The initiation and maintenance of *Shisha* smoking has shown to be related to social relations, familial social norms, family income, occupation, education level. For example, a study in Misurata, Libya, concluded that, lower education and lower income was significantly associated with early initiation and long duration of Hookah usage (Sugathan et al., 2010).

In a study by Braun et al. (2011), social gatherings, peer influence and relaxation were the three motivations for using hookah. It appears that, according to Braun et al, college students are introduced to hookah by a close friend signifying a strong peer influence, parties and other social events implicitly and explicitly affect hookah use, while the nicotine, among experienced users, provides a calming effect. These concomitant factors place students at risk for nicotine addiction (if they are not addicted already), respiratory impairments, cancers, and cardiovascular diseases (Bedwan et al.,1997)(Ward et.,2007) .Weglicki et al. (2008) conducted a study among a community sample of Arab- American and non Arab- American high school students, the study concluded that the Arab – American youth had higher prevalence of ever water pipe smoking and current water pipe smoking than non Arab-Americans ,respectively

(38% vs. 21% ever smokers; 17 % vs. 11% current smokers) (Weglicki et al.,2008). This may be attributed to water pipe tobacco being more customary in families of Middle Eastern descent. Jamil et al. (2011) did find a positive correlation between having a father, mother or sibling smoking water pipe tobacco at home and an individual smoking water pipe tobacco (OR=9.5,P<0.01). This study suggests that familial social norms and customs of Arab-Americans may contribute to initiation and continuation of smoking water pipe tobacco in younger adult males (Jamil et al., 2011).

Attitudes of water pipe tobacco smokers

The attitudes of continuing Shisha smokers towards water pipe tobacco smoking and quitting and the influence of those attitudes to others are well documented in various studies. According to Fishbein and Ajzen's Theory of Reasoned Action (TRA) (Fishbein & Ajzein, 1975), attitudes are a function of personal beliefs. For example, a person who holds positive beliefs about smoking is more likely to have a positive attitude towards smoking and those with negative beliefs will more likely have negative attitudes (Martinasek, 2011). A study of Baska et al. (2007) in Slovakia showed that attitudes towards tobacco use among the adolescents were closely related to their smoking status i.e. current smokers more frequently reported positive attitudes. Prior research on adolescent smoking behavior indicated more positive attitude toward smoking and smokers tended to related with an increased likelihood of smoking (Shashidar et al., 2011).

Jaffri et al.(2009) conducted a study among the university and college students of Karachi Pakistan, this study found that overall prevalence of water pipe smoking was found to be 45.2 % with current water pipe smokers of 16.5% males and 5.7% females (p=<0.001). About 39.3% (160/407) of them were found to have inadequate knowledge and 64% had positive attitude about water pipe smoking. It was found that inadequate knowledge and negative attitude towards water pipe is significantly associated with current water pipe smoking than former or ever water pipe smokers (p=<0.001). So the study concluded that inadequate knowledge and social acceptability of water pipe smoking and the male gender are leading to high current smoking tendency among young adults in Karachi, Pakistan.

Perceptions and Beliefs of water pipe tobacco smokers

There are perceptions, beliefs and myths among users of water pipe tobacco which seem to be universal, for example, the ones based on the role of water during *Shisha* smoking. It appears to be a global phenomenon among the hookah smokers to have a false perception that hookah smoke is filtered through water and thus is less harmful in nature as compared to cigarette smoking (Aljarrah et al., 2009). To add this, the advertisements on the internet that it is safe, makes this a challenging task to handle (Knishkowy and Amitai, 2005).

Although, the users perceive hookah smoking to be less addictive and less hazardous to health than cigarette smoking, the researchers draw diametrically opposite conclusions (Martinasek, 2011). The increasing trend of water pipe smoking observed in the last decade is accredited to the misconceptions regarding it use, for instance that nicotine content is lower than that of cigarette and that water filters out all the noxious chemicals including carbon monoxide, nicotine and tar (Maziak, et al.,2004). However new research has suggested that the water pipes have additional lethal risks over cigarette smoking (Ash News Release, 2007). Flavoured tobacco is smoked over coals and fumes from these fuels add new toxins to the already dangerous smoke. *Shisha* smokers inhale up to 200 times more smoke in single *Shisha* session than from a cigarette; and its social acceptance has resulted in high levels of second hand smoke. Water pipe smoking is perceived by many adolescents, the general public, even health professionals as being less dangerous than cigarette smoking (Maziak. et al., 2004a).

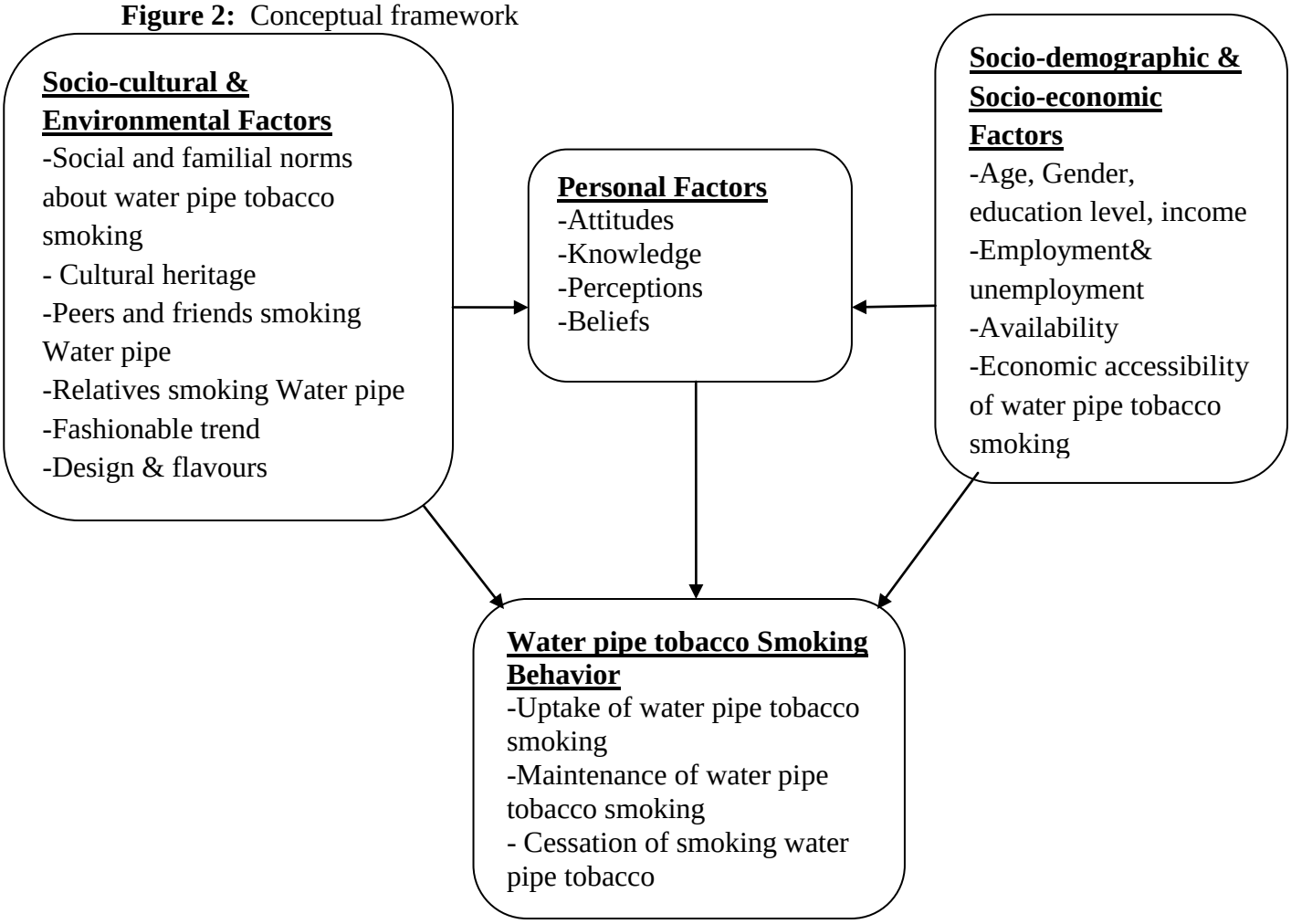
In a study conducted among college students of a Midwest University by Braun et al. (2011), it was found out that students grossly underestimate not only the addictive properties of hookah but also the health risks associated with its use. According to these researchers, an overwhelmingly majority believed they could quit smoking hookah at anytime. This "optimistic bias" represents one of the challenges in working with college students – that is a perception of invincibility- "it could never happen to me" (Dillard et al., 2006). This developmental characteristic of young adults places them at increased risk for addiction, particularly among those students with poor impulse control, high sensation seeking tendencies and underdeveloped cognitive controls (Herrman,2005)(Radzik et al.,2002).

The global tobacco epidemic may kill 10 million people worldwide in the next 20- 30 years. More than 70 % of these deaths are estimated to occur in developing countries. Current research, treatment and policy efforts focus on cigarettes, while many people in developing regions smoke tobacco using hookah or *Shisha* (Maziak et al., 2004).

1.2 CONCEPTUAL FRAMEWORK

The below figure depicts a conceptual framework of the various factors that have been found to influence water pipe tobacco use among young men and women in Kinondoni Municipality. Socio-demographic, socio-economic, socio-cultural and environmental factors directly influence the attitudes, perceptions, knowledge and beliefs (personal factors) of water pipe tobacco smokers. And in turn all three sets of factors directly influence the smoking behavior of water pipe tobacco smokers.

Figure 2: Conceptual framework



1.3 STATEMENT OF THE PROBLEM

A recent study (STEPS survey 2013) conducted by the National Institute for Medical Research (NIMR) has revealed that an estimated 16 percent of adults in Tanzania smoke tobacco. However just like in many other tobacco use studies in the country, the prevalence of those who smoke water pipe tobacco (*Shisha*) is neither specified nor mentioned. In fact no research studies have been done in water pipe tobacco smoking in Tanzania and there is no official statistics on the number of users, that is, the number of those who smoke *Shisha* in not known, and its contribution to the overall use of tobacco is also not known.

Though there is no official statistics of those smoking Water pipe tobacco and the extent of its distribution in the country is also not known, in cities like Dar es Salaam and Arusha, the trend of *Shisha* smoking is obviously gaining popularity as witnessed by the increasing number of places especially hotels, nightclubs, bars and cafes selling this kind of tobacco. Personal observation by the researcher led to the conclusion that areas of Dar es Salaam where *Shisha* is popular (as shown by number of selling points and clients) include Coco beach, Oysterbay, Morocco, Mikocheni, Sinza lion, Sinza Makaburini, Sinza Shekilango, Kawe, Shoppers Plaza, Slipway Complex and nearly all big hotels, that is Sea Cliff, Golden Tulip, Double Tree Hotel, Coral Reefs Hotel.As you may note all these areas are in Kinondoni Municipality.

Preliminary study by this researcher has established that most of the clients of *Shisha* in the bars, nightclubs, restaurants and cafes are youth. It is now common for bars, night clubs and hotels to set aside a room or place specific for *Shisha* smoking. These rooms are given various names, example, *Shisha* lounge, *Shisha* parlour, hookah lounge, *Shisha* garden, *Shisha* cafes etc. Gone are the days when *Shisha* was available and sold in big hotels to mostly foreign clients and Tanzanians of high income. Today *Shisha* is available in street bars and nightclubs used mostly by young men and women.

The Head of the Mental Health and Substance Abuse Unit in the Ministry of Health and Social welfare, Dr.Norman Sabuni, quoted by the Government Newspaper, the Sunday News of 29 September 2013, highlighted the gravity of the situation, by pointing out that, as per the current trends, for bar to appear fashionable today, it has to have *Shisha* parlor and thus the

reason why they are mushrooming all over Dar es salaam and other urban regions. This raised serious concerns because for starters, *Shisha* smoking can be addictive and this means that addicts are being produced while very young.

In Kinondoni municipality like in many other parts of the world, water pipe tobacco smoking is probably not regarded as significant health hazard compared to cigarettes and it is therefore common to see it smoked indoors like in bars, nightclubs, Shisha lounges and cafes, where many people including non-smokers are exposed to second hand smoke, this exposure poses a serious health risk.

In Tanzania like in other parts of the developing world, tobacco water pipes are not subjected to the same regulations as cigarettes and other tobacco products. According to the regulations governing smoking in public places, water pipe tobacco smokers are not breaking any law simply because tobacco water pipes are not classified as cigarettes. As already highlighted, the production of water pipe tobacco is unregulated. Unlike cigarettes and other tobacco products, water pipe tobacco packaging and accessories often have misleading and inaccurate content descriptions further to that smokers normally do not have access to content descriptions as the water pipes are usually prepared by the owners or their employees. As reported in various studies, there are no water pipe- specific health warning labels on *Shisha* products and their accessories like you would find in Cigarette packs and other tobacco products.

Despite the fact that water pipe smoking is widely used in the world and now its popularity in Tanzania is growing as exemplified by the number of new selling points and clients, it is very difficult to get data on water pipe tobacco smoking or *Shisha* smoking in the general population. Researches, treatments and policy efforts on Tobacco use in Tanzania have concentrated and focused on cigarettes smoking hence it is very difficult to find studies on water pipe tobacco smoking and therefore little is known about the habit, its patterns of use and health consequences in the country.

1.4 RATIONALE

This qualitative study will contribute to shedding some light on the social meaning, social determinants, beliefs and perceived effects, of *Shisha* smoking among young people. This study may provide an important input in the improvement of health by educating the public especially young men and women on the deleterious effects of water pipe tobacco smoking. It should be noted that prevention of lung disease and promotion of lung health has been one of the primary overall goal of public health since its inception so research like this one are much needed to educate and sensitize the public so as to curb the morbidity and mortality related to smoking.

This study of water pipe tobacco smoking will be one of the alarm calls for public health authorities in the country as these authorities have always paid attention to conventional forms of tobacco smoking such as cigarettes and cigars. The findings from the study will highlight and bring to the attention the extent of water pipe tobacco smoking problem and its related factors. Getting better understanding of predictors of water pipe smoking from the general population will aid in developing and tailoring programs and health messages.

Part of the research gap in water pipe tobacco smoking also needs to be filled and the danger of *Shisha* smoking highlighted. In the country where efforts to publicize the effects of tobacco use have focused more on cigarette smoking, tobacco chewing and snuffing, understanding the factors behind the use of water pipe smoking is crucial if appropriate prevention, cessation and policy interventions are to be formulated and bolster the fight against tobacco use.

1.5 RESEARCH QUESTIONS

The study will be guided by three research questions

1. What are the attitudes, local beliefs and meanings attached to water pipe tobacco smoking among young smokers
2. What are the social determinants and motivation for water pipe tobacco (*Shisha)* smoking?
3. What are the perceived health effects of water pipe tobacco smoking among young *Shisha* smokers

1.6 OBJECTIVES

The general objective of the study is to gain an in-depth understanding of the factors related to water pipe smoking among youth in the general population.

The specific objectives are to:

1. Explore local beliefs related to water pipe smoking among young smokers
2. To identify attitudes of young smokers towards water pipe tobacco smoking
3. To explore meanings attached to water pipe tobacco smoking among young smokers
4. To identify social determinants associated with water pipe smoking among young smokers
5. To explore perceived health effects of water pipe smoking among young *Shisha* smokers

CHAPTER TWO

2.0 METHODOLOGY

2.1 Study Design

The type of study design was Phenomenological study to explore social determinants, perceptions, beliefs and attitudes of *Shisha* smokers in Kinondoni district. Phenomenological studies seek to describe in depth something that exists as a part of the world in which we live. We are surrounded by many phenomena, which we are aware of but not fully understand. Phenomenological research begins with the acknowledgement that there is a gap in our understanding and that clarification or illumination will be of benefit.

Water pipe smoking is one of the phenomena surrounding us, which some people are aware of but not fully understand. The lack of understanding of water pipe tobacco or *Shisha* smoking as its popularly known may exist because the phenomenon has not been overtly described and explained or our understanding of the impact it makes may be unclear. The phenomenological studies are required on water pipe tobacco smoking to give the public the much needed insights and raise awareness especially on health risks.

2.2 Study Area

The study area was Kinondoni Municipality. This Municipality is in Dar es Salaam region and has an area of 531Km² and it is the most populous one with a population of 1.7m people (National Census, 2012). Kinondoni is well known for its numerous entertainments centres like bars and nightclubs, also prosperous suburbs and the biggest slum in the city, Manzese which has poor planning and low quality housing .At the present the district has 33 public health facilities and 168 private health facilities. There is one municipal public hospital (Mwananyamala) and two (2) municipal public health centers namely Magomeni and Sinza and the remaining are dispensaries. There are no specific health programs to address the issue of tobacco use and also there are no health facilities or rehabilitation centres for addicted smokers of tobacco in Kinondoni

Though it's difficult to establish a total number of bars, clubs, and restaurants in the district, evidence increasingly shows that Kinondoni has so many of these and it is very likely it has the highest number of them compared to other districts. Bars and other alcohol joints normally sell cigarettes and now some of them are adapting to the *Shisha* business. In some bars, hotels and restaurants there are separate smoking rooms i.e. *Shisha* lounge but in most bars smoking of cigarettes and *Shisha* is done almost anywhere.

2.3 Study Population

Male and female water pipe tobacco (*Shisha*) smokers aged 15 to 35 in the general population of Kinondoni Municipality. This age group was chosen because a report by World Health Organization (WHO, 2008) and studies in Middle East, Western Europe and North America indicated that teens and youth younger than 20 years old are the common consumers of flavored tobacco (Korn et al., 2008; Aljarrah et al., 2009) and though the United Nations has defined youth as young men and women between age of 15 and 24, the actual practice in Tanzania is that young people between 15 to 35 years are treated as youth. The policy statement in the National Youth Development Policy says this; youth in Tanzania shall be defined as young men and women from the age group of 15 to 35. So for the purpose of this study, which was conducted in Tanzania, youth refers to individuals between the age of 15 and 35 years.

2.4 Sample size

Sample sizes for qualitative studies are generally much smaller than those used in quantitative studies. There is a point of diminishing return to a qualitative sample –as a study goes on more data does not necessarily lead to more information. This is because one occurrence of apiece of data is all that is necessary to ensure that it becomes part of the analysis framework (Mason, 2010).

A number of issues therefore affected a sample size in this study; however the guiding principle was the concept of saturation. The other things which affected the sample size in this study were a number of factors as enumerated below

1. Quality of data
2. The scope of the study
3. The nature of the topic
4. The amount of useful information obtained from each study participant, the number of interviews per participant etc…

So, the interviews (semi structured) went on until saturation point was reached i.e. until I observed that information being generated from different participants was repetitive and sometime irrelevant and could not add new themes. Thus a total number of young men and women interviewed were 44.

2.5 Sampling Procedure

The type sampling that was used is Maximum Variation Sampling. This type of sampling also known as heterogeneous sampling is a purposive sampling technique used to capture a wide range of perspectives related the phenomenon that the researcher is interested in studying, that is maximum variation sampling is a search for the variation in perspectives, ranging from those conditions that are viewed to be typical through to those that are more extreme in nature (Lund Research Ltd, 2012). According to Patton (1990), this strategy for purposeful sampling aims at capturing and describing the central themes or principal outcomes that cut across a great deal of participant or program variation. For small samples a great deal of heterogeneity can be a problem because individual cases are so different from each other. The maximum variation sampling strategy turns that apparent weakness into strength by applying the following logic: Any common patterns that emerge from great variation are of particular interest and value in capturing the core experiences and central, shared aspects or impacts of a program. Patton (1990) continues to explain that when selecting a small sample of great diversity, the data collection and analysis will yield two kinds of findings: (1) high quality, detailed descriptions of each case, which are useful for documenting uniqueness, and (2) important shared patterns that cut across cases and derive their significance from having emerged out of heterogeneity.

Conditions in maximum variation sampling mean units (i.e. people, cases, organizations, events, etc...) that are of interest to the researcher. The said units may exhibit a wide range of attributes, experiences, behavior, qualities and situations. The basic principle behind the use of maximum variation sampling is to gain greater insights into a phenomenon by looking at it from all angles (Lund Research Ltd, 2012). This can often help the researcher to identify common themes that are evident across the picked sample.

Participants (*Shisha* smokers) in the study were approached in *Shisha* clubs, cafes, bars, hotels and restaurants while they were smoking the water pipes. Smoking the water pipe during the actual time when the researcher and his assistant are visiting the *Shisha* places was one of the ways in initial identification of water pipe smokers. A smoker of any sex or ethnicity but falling within a range of 15 to 35 years as per inclusion criteria (participants were asked their age as part of the interview) was picked as a potential respondent and he or she was requested to point out other fellow smokers in the same settings.

The smokers were requested for the interviews and when they agreed they were asked on the appropriate time for the said interviews. For those smokers who were willing to be interviewed right there in the natural settings, the interviews were conducted. And the rest who were unwilling to be interviewed at the smoking places, appointments and arrangements were made to meet them at other times and places.

2.6 Data Collection tool

The semi structured interviews were used to collect data from respondents. This type of interview sometimes is referred as focused interviews which involve a series of open ended questions based on the topic areas the researcher wants to cover. The questions asked on this study were on social determinants, availability, affordability, smoking status, behavioral beliefs and sensory qualities. (Refer to appendix 1). The open ended nature of the questions defines the topic under investigation but provides opportunities for both interviewer and interviewee to discuss some topics in more detail. If the interviewee has difficulty answering a question or provides only a brief response, the interviewer can use cues or prompts to

encourage the interviewee to consider the question further (Hancock, 2002). In this type of interview, the interviewer also has the freedom to probe the interviewee to elaborate on the original response or to follow a line of inquiry introduced by interviewee.

Semi structured interviews tend to work well when the interviewer has already identified a number of aspects he wants to be sure of addressing. The interviewer can decide in advance what areas to cover but is open and receptive to unexpected information from the interviewee (Hancock, 2002). The information collected is a primary data in the form of participants' rich descriptions of their perceptions, experiences, beliefs, behaviors and characteristics.

Data collection was assisted by a research assistant trained and highly experienced in qualitative methods. The appropriate time for data collection was in the evening throughout into the night. This was a time when most of the bars and clubs were open and *Shisha* smokers were easily found. Both audio recording and note taking were used as some respondents were not willing to have their voices recorded.

2.7 Data processing and analysis

Interviews were transcribed immediately after returning from the field and tape analysis was also used (that is taking notes from a play back of the recorded interview).

Constant Comparative Analysis was used in analyzing data. This is a process whereby data collection and analysis occur on ongoing basis. The first interview which in this case was semi structured was conducted, then transcribed and analyzed as soon as possible, before the next interview took place and interesting findings were incorporated into the next interview. The process was repeated with each interview.

The initial interviews were a bit different compared to the later interviews because the interview schedule was continuously informed and revised as the study progressed. Data was revisited and categorization reviewed until the researcher became sure that all the themes and categories used to summarize and describe the findings are truthful and accurate reflection of data

Data analysis was done manually and at no point was qualitative software was employed. Key quotations were selected to illustrate various features e.g. breadth of ideas, similarities or differences among respondents, strength of opinion of beliefs etc.

A total of 44 interviews were done .Detailed notes were made from listening to the recordings, this included quotations used in the section of results in manuscript. Responses from participants were grouped into themes and later on analyzed for connections between individuals. At the end of analysis certain groups of themes were later unified as single broader theme .The end result of this was 12 themes and 29 Sub- themes. (Refer to appendix 5).

2.8Ethical Consideration

Ethical clearance was obtained from the Ethical Clearance Committee of the Muhimbili University of Health and Allied Sciences (MUHAS). The participants of the study were assured of the anonymity and confidentiality of what they were saying and the fact that the findings of the study will be used academically and in improving the wellbeing of the people in terms of public health improvements. Study participants were always assured that findings of this study would no way be used for purposes other than of this study.

Verbal consent was sought from participants before the interviews. However, there were five (5) water pipe tobacco smokers who refused to be interviewed, their reasons for refusal were two, there were those who did not want to be bothered and those who did not want their voice to be recorded, their decisions were accepted and they were left alone.

Before conducting interviews, permission was sought from the responsible authority by following the normal administrative structure e.g. ward leader, ward executive officer, municipal director. For those interviews which were conducted in the natural settings of *Shisha* smoking e.g. in bars and *Shisha* cafes and lounges, permission was sought from the *Shisha* vendor and people who manage (managers) these places whenever they were available.

CHAPTER THREE

3.0 FINDINGS

3.1 Socio-demographic characteristics of water pipe tobacco smokers

A total of 44 (12 females and 32 males) participants took part in the study. Their ages ranged from 18 years to 35. Nearly 69 percent were people aged 25 years and below. Only 14 participants were above 25 years. All students interviewed were either at college or University level; these were 12 which is equivalent to 27%. Only 10 participants have formal employment, the remaining participants who were not students were either unemployed or self employed with small business activities. Only 7 participants have college or university education and 22 participants had secondary education majority being form four leavers and three respondents had standard seven education level. Only three study participants reported to have a monthly income above one million Tanzanian shillings (TZS), the monthly incomes of the remaining participants ranged between TZS 100,000 up to 800,000 TZS. Majority had a difficulty giving estimates of their income because they are either students or unemployed youth with unreliable income from small businesses. Most respondents described themselves as low income and middle income people.

Table 1: Socio demographic characteristics of Water pipe tobacco smokers

Characteristics	**N**	**% of participants**
Gender		
Male	32	76
Female	12	24
Age group		
18-23	18	41
24-29	23	52
30-35	3	7
Level of education		
Primary school education	3	7
Secondary education	22	50
College/University education(completed)	7	16
Still studying (College & University)	12	27
Employment status		
Employed	10	23
Unemployed /self employed	22	50
Student	12	27

3.2 Themes

As already highlighted, a total of 44 interviews were done and they were sufficient in identification of a number of specific themes. The themes were then grouped into major themes and sub themes as summarized in table 1 below.

Table 2: List of themes

Themes	Sub themes
1.Peer pressure	1.1. Social activity 1.2. Friendship 1.3. Company
2.Sensory qualities	2.1. Flavors 2.2. Shape 2.3. Design
3.Availability	3.1. Curiosity 3.2. Increasing exposure
4.Affordability	4.1. Cost sharing 4.2. Pipe sharing 4.3. Cheapness
5.Fashionable trend	5.1. Show off 5.2. Prestige 5.3. Status 5.4. Imitation
6.Relaxation	6.1. Refreshment 6.2. Entertainment 6.3. Luxury 6.4. Stress 6.5. Feeling low 6.6. Boredom 6.7. Pleasure 6.8. Leisure
7.Addiction	7.1. Smoking patterns 7.2. Weather 7.3. Occupation
8.Knowledge of water pipe tobacco smoking	8.1. Misconceptions 8.2. Ignorance
9.Health problems	10.2. Short term health effects 10.2.Long term health effects
10.Health Beliefs	10.1. Level of nicotine and its absence 10.2.Addiction 10.3 Harmfulness
11.Cultural and Social Context	11.1.Relatives and friends acceptability 11.2. Cultural heritage
12.Cigarettes, Shisha and Marijuana	12.1.Smoking frequency 12.2. Smoke lightness 12.3. The high, the buzz, the head rush 12.4. Health effects

3.2.1 Peer Pressure

Of the 44 study participants 22 participants claimed to have started using *Shisha* after being influenced by friends. That number of participants is 50 % of all study participants. Most of these saw their friends smoking the water pipes in selling joints (bars, clubs and hotels), they asked to try and to be taught how to smoke. Others heard about *Shisha* from friends and they went out looking for it. Two young ladies were taught by their boyfriends how to smoke and since then they have been smoking.

> *"It is because of my company, they are using it, so I had the desire to smoke, I tried and I succeeded*" (female, 21 years old)

> *"When my friends were smoking I was attracted by the smell of the smoke, I tested it and I started to use. I have been smoking for the past two years now"* (female, 24 years old)

Peer influence was not only noted among college and university students, it was also seen among smokers who were no longer in school but they were in the same age group with students. Peer influence was also noted among slightly older smokers, those who were in their early thirties, employed and in some situations already married. One lady was taught by her husband how to smoke the water pipe tobacco and she is now habitual smoker. Below is what she said.

> *"I knew about it when I was married, because my husband likes it very much"*

When asked how she started:

> "*My husband taught me and I get used to it, I have it at my home*" (female, 26 years old).

The oldest of all ladies to be interviewed described her experience in the following verbatim.

> *"I heard people talking about Shisha, Shisha, so I asked myself what is Shisha? I later come to know it was something people were smoking. I was convinced by friends to*

> *smoke. We were at coco beach and someone ordered Shisha and she started smoking and people said let us try and truly we tried, I started smoking and I liked it"* (a married female,33 years with two years water pipe tobacco smoking experience)

Another *Shisha* user had the following to say:

> *"I have friends who are smoking Shisha. We used to sit at coco beach and I saw a friend smoking and I decided to start. The first time I coughed a lot, but am now used to it."* (Male, 26 years old).

3.2.2 Sensory qualities.

Nearly all respondents said they were attracted by the flavors used in water pipe tobacco and have specific favorite flavors. Only two male respondents didn't have specific favorite flavors, they didn't care about flavors and one was actually wary of flavors because he thought they were dangerous chemicals. Most of the male smokers liked the flavor of mint and at least two liked the mixture of mint and other flavors like orange and bubble gum. The favorite flavors for ladies were strawberry, apple and vanilla. Several study participants pointed out that without the flavors they cannot smoke *Shisha*.

> *"I like the flavor of mint it is like SM (sweet menthol cigarettes), towards the end of smoking it starts to smell like those old SMs" (*male, 28 years old).

Another respondent had this to say on flavors:

> *"It is not easy to smoke without a flavor because flavor is the big thing, the taste left in your mouth is different from the one left by marijuana or a person smoking cigarette. If you pass by a cigarette smoker, you would know this is a cigarette smoker but if you meet me and I talked to you it is like talking to someone who was chewing bubble gum. This is why people like Shisha more than cigarette*." (Male, 29 years).

One male participant likes the lightness of the Shisha smoke and another, a student from a financial institution likes specifically to inhale and blow out all this white smoke.

At least 39 participants liked the shape and design of the water pipe apparatus. Among these, one participant liked the big bowl because of the big volume of smoke released and others liked bowls with two or three hoses because they were convenient when two or three people are sharing one Shisha.

But three participants were not very happy with the water pipe tobacco apparatus. Of those three, two were fascinated by the design and science behind the water pipe apparatus but they had misgivings that the bowl and its parts were too big and you cannot move around with it the way you would with a cigarette. These participants would have wanted a *Shisha* which is portable so that the necessity to smoke it right in the selling point would not be there.

3.2.3Availability

During the interviews all participants with exception of only three, made observation that *Shisha* was now available in many places and more and more people were now smoking *Shisha*.

> *"Now days they are too many (Shisha pipes), even in upcountry you get them, Morogoro, Dodoma, in the big regions and towns you find it. In the past it was not available, in Dar es Salaam it was available in very few places, now days you find it in many places. But it's not something you would just find in any place; you find it in special places"* (female, 33 years old).

> *For Dar es Salaam, it is easy; it is available in many places* (male, 21 years old with 1 year experience of water pipe tobacco smoking).

But other participants thought the availability is too much far too much. One of them was quoted as saying:

> *"The availability is too much, every hotel is opening a Shisha place, there are too many Shisha* (tobacco water pipes), *too many"*. (Male 24 years old with 4 years water pipe tobacco smoking).

Three participants, one female and two males mentioned that they have the water pipe tobacco apparatus at home and sometime they smoke it there.

3.2.4 Affordability

There are variations in *Shisha* prices depending on where it is being sold. The prices in local bars and night clubs in Sinza, Mwananyamala, Mwenge and Kinondoni range between TZS 2000 to TZS 7000 but in hotels and affluent neighborhoods the price is between TZS 10,000 to TZS 15,000. The price of *Shisha* is high compared to that of cigarette and other tobacco products. A cigarette, for example, sells at TZS 200 per single unit and TZS 2000 for a packet. While majority of the participants were of the view that Shisha is very expensive for middle income and low income smokers, other respondents had a totally different opinion.

> *"The price is high, real high especially for unemployed person like me, business is tough and I have to come to the streets of town centre"* (male, 18 years old)
>
> *"The costs of smoking Shisha in Tanzania are still high. The lowest price for Shisha is TZS 2000, that is the price in Kinondoni but in the hotels it is TZS 10,000, 7000 and 15,000"* (male, 28 years old)
>
> *"The costs for us people of low income are a bit high. The price is 10,000. Sometime three of us will contribute and share the Shisha"* (male 28, years old)

Fifteen participants claimed that *Shisha* price is very affordable and that in some places in Mwananyamala the price of water pipe tobacco is as small as TZS 2500 per a single water pipe or a smoking session.

> *"The cost is not high at all. When am with friends we contribute and share the cost*."(Male, 34 years old with a two years water pipe tobacco smoking experience).

> *"The price is small, I can afford it, here in Kinondoni it is TZS 3000 up to TZS 5000 shillings, at Coco beach it is 8000"*. (Male, 21 years old).

While the opinions were different among the participants, affordability was one of the common themes. To deal with high costs in posh hotels, bars and affluent places like Masaki and Oysterbay, young smokers were resorting to cost sharing and sharing the tobacco water pipes.

3.2.5 Fashionable Trend

For some study participants, smoking water pipe tobacco now days is a fashion. They claim not to be addicted and for others they don't even feel "the buzz" or the "high" caused by the chemicals in water pipe tobacco. They just smoke it because it is fashionable and they are seeing other people also smoking. Other study participants associated it with status and prestige because of its price and the places where it was initially sold before local bars and clubs also started selling it.

> *"I smoke it just as a fashion, I see people smoke so I smoke."* (Male, 23 years old)
>
> *"A person who smokes Shisha is civilized, that is, he understands himself because he pays lots of money. Anybody can smoke cigarettes, a gangster, a bicycle mechanic, plumber, thief but Shisha is smoked by someone who understands himself and pay lots of money to get his Shisha"* (male, 22 years)

> *"It is just imitating, you know in bongo we imitate"* (Female, 20 years old)

3.2.6 Relaxation

Both male and female study participants brought up the issue of relaxation several times in most of the interviews. If they were not talking about relaxation then in its place they talk about feeling good, pleasured, leisure, enjoyment, refreshment. For these participants *Shisha* smoking is relaxing and mind refreshing and it also helps to remove boredom, stress, tension, anger and also assisting in forgetting life troubles.

> *"Sometime I smoke Shisha because I feel low, not good at all, so I feel If I smoke Shisha I can become well and true after smoking I feel that way"* (Male, 28 years)

> *"If am stressed, the stress goes down, I feel relaxed with no troubles"* (female, 24 years old with two years smoking experience)

Two participants, both males, who also happened to be cigarettes smokers, compared the relaxation and enjoyment effect with that of cigarettes. They called that effect *stimu* which is Swahili slang for high or head rush.

> *"Because I was a person who was already smoking cigarette so when I saw it (Shisha) and smoke, it increased that stimu(high) and I realized it was much better"* (male 21 years old with one year water pipe tobacco smoking experience)

When the above smoker was asked about the contents of the *Shisha* he smokes, he was quoted as saying:

> *"I have never done an investigation but I think it is just like a cigarette"*

3.2.7 Addiction

Addiction of water pipe tobacco was an issue which was highlighted by a number of study participants. A number of participants disputed the fact that water pipe tobacco is addictive but others were categorical that water pipe tobacco is addictive and they were actually addicted. Normally the issue of addiction came up from participants even without prompting up.

There were participants who were at least knowledgeable about the health effects of water pipe tobacco but when they were asked why they continue smoking even after knowing the health effects they simply reply they were addicted.

> *"Shisha has 'arosto' (addiction), you sit down and you keep thinking now I need to go and buy Shisha and smoke, it is like cigarette, it is disturbing. The first time you get headache or you might be happy, it is all about the way someone smoke"* (male, 21 years old, a Shisha vendor with an experience of 4 years of water pipe tobacco smoking)
>
> *"Shisha has addiction that why we normally go looking for a bar which has no Shisha to avoid smoking"* (male, 30 years old)
> *"I am now a patient of Shisha, a day can't pass without smoking, it does not feel right may be when am sick*" (male, 26 years old, a vendor of *Shisha*)
>
> *"The addiction is like that of alcohol but the frequency of smoking is low compared to cigarettes"* (male, 26 years old)
>
> *"You know Shisha has 'stimu' (the addictive high) like cigarette, once you are in you can't leave"* (male, 24 year old with 4 years experience of smoking water pipe tobacco)

3.2.8 Knowledge on water pipe tobacco

There is an obvious lack of knowledge of the contents and the health effects of water pipe tobacco or *Shisha as popularly* known in Dar es Salaam. Some participants have a relatively high knowledge on the contents and health effects but for others the knowledge is wanting.

On the contents, 5 study participants which is 11% of all respondents said they didn't know the contents, 23% mentioned flavors and water as the only contents of *Shisha* and among these one lady confidently mentioned a third component, alcohol. At least 57% of the participants mentioned flavors and tobacco as the contents, two respondents equivalent to 4%

were not sure about the contents, one among these two said she didn't care anyway but think it might be just like cigarettes and one participant knew tobacco as the only content.

> *"To say the truth it is just tobacco which has various flavors, I don't know if there is something else. Health effects? I don't know, I have not heard if it has health effects, if it has then it might be the health effects like those of cigarettes. May be Tuberculosis"* (male, 28 years old)

On the health effects, 16% of participants pointed out that *Shisha* as they know it has no health effects, another 16% said they didn't know about any effect of water pipe tobacco smoking. Twenty participants which are 45% of all participants said *Shisha* has health effects and they proceeded to mention them. The most cited health effects were various forms of cancer; throat cancer, brain cancer, cancer of the back ,lung cancer, other effects were Tuberculosis, widening of throat, damaged lungs, painful chest, back pain, tightness in the chest, heart full of water, addiction, quickened heartbeats, impotence etc.. But 16% of participants were those who said for sure that they knew or heard that *Shisha* has health effects but they don't know exactly what these effects were, some of these thought the effects might be the same like those of cigarettes or more because there is a smoke and the volume of it is high. Three participants or 7% of the respondents were not sure if smoking water pipe tobacco has any health effects.

A lady smoker was quoted as saying:

> *"We don't know those health effects; we have never seen a person getting sick because he smoked Shisha. You know, even those very young Arabic children are given Shisha to smoke"* (female, 20 years old)

Another lady smoker had never heard anything on the health effects of Shisha smoking, she had this to say:

> *"I have never heard that it (Shisha) has health effects, I have been smoking for the past two years and I have not experienced any problems"* (Female, 24 years old)

A male smoker, 23 years old with a water pipe tobacco smoking experience of three years had this to say on the knowledge of health effects:

> *"It has risks to say the truth, the health effects I know are lungs and chest getting hurt. But the way it is, if you want it you forget the effects, you just smoke because we have just heard but we have not seen it. I have been smoking this thing for three years now. I just smoke, I don't bother that much with the effects, if you bother yourself with the effects you would not even drink water. When I smoke I don't think about that".*

Though nearly half of respondents had some knowledge about the health effects, the knowledge was so limited i.e. without much detail. Most of the participants had heard about the effects from friends and fellow smokers. Three participants had read about the effects in the internet. No participant mentioned the burning charcoal as one of the contents or other chemicals released by the burning tobacco and charcoal except nicotine.

Tuberculosis (TB) was the second most cited health effect of water pipe tobacco smoking but it was obvious the smokers did not know the mode of infection through the water pipe. Some thought you get the TB if you smoke the water pipe tobacco for too long. Only one smoker knew that, he could get TB by sharing a water pipe hose and a mouth piece with someone infected with TB.

3.2.9 Health Beliefs

Participants were found to have strange health beliefs. There were those who believed that smoking *Shisha* for certain minutes is safe, others had heard about the health effects so to avoid them they smoke at least once, twice or thrice per week. Other participants feel quite safe for they smoke once per month.

A 24 years Shisha smoker with over 4 year's water pipe tobacco smoking was quoted as saying:

> *"Yes I know the health effects, if you smoke for too long you will get TB. Shisha smoking has its time, they give it you, if you use it properly you don't get those effects but you use it wrongly you end up with those effects. 45 minutes is recommended for a single flavor they have given you. So if you exceed those minutes of smoking, the flavor gets finished and nicotine and tobacco remain."*

When it was mentioned by the researcher that other smokers of *Shisha* had experienced vomiting. The above smoker had this to say:

> *"Yeah! Those are the effects they get! If you smoke within 45 minutes its good for your health but you exceed that and you should know, that is dangerous!"*

Three male participants believed that water pipe tobacco smoking is safe because during smoking the smoke goes through the water in the bowl so the poisons and nicotine are filtered from it (smoke). Two other participants pointed out that, water was reducing the poisons though not much.

A male smoker, 21 years old with 4 years of water pipe tobacco smoking experience and also a *Shisha* vendor himself was quoted as saying:

> *"The smoke must pass through the water; experts are saying the water cuts down nicotine because the smoke must go through the water before you can smoke it. So, that smoke has no health effects, that is, what they are saying. Cigarettes smoke hurts a lot."*

Some participants associated the lightness of *Shisha* smoke with less harmful health effects. A young university student was quoted as saying:

> *"Shisha has health effects, but people like the flavor. Everything has advantage and disadvantages and the disadvantages of Shisha are very small".*

Asked why, he had this to say:

> *"Because Shisha smoke is light so it affects you to a very small extent compared to a cigarette smoker"* (Male, 23 years old).

For those who have heard or at least read about the health effects of water pipe in the internet they are employing various methods which they believe to be capable in countering the effects. There are those who are smoking at least twice per week and others on monthly basis. But there are others who believe that by "swallowing" (inhaling during the puffing) a little amount of smoke they will be okay. By swallowing, they meant inhaling.

One smoker had this to say:

> *"You can see the way I do it, I smoke but I don't swallow (inhale) this smoke. It's just smoking and releasing the smoke. I can smoke for 100 or 20 times but swallowing (inhaling) only once"*. (Male, 27 years).

Another smoker of *Shisha* who is also cigarette smoker and has over six years smoking experience had a startling observation:

> *"I don't have a specific flavor, after all, the entire filter goes through the water, so you don't smoke a Shisha smoke but you smoke a vapor. Am worried about the flavors I don't know what drugs or chemicals they are"*. (Male, 24 years old)

Some smokers wrongly refer to the mouth piece as a filter. But the said mouth pieces have no filtering mechanisms. In some *Shisha* joints, new disposable mouth pieces are always issued but in others the same mouth pieces are reused after being washed. Regarding mouth piece and the apparatus, smokers had things to say.

> *"The apparatus is good, it stays up there and it does not bother you. You see, they give you your own new 'filter' and you use it for six hours"*.(Female,24 years with over two years water pipe tobacco smoking experience)

> *"The Shisha accessories are good and in using I see them as safe especially in terms of cleanliness. Shisha people (vendors) clean all the accessories and there is safety*

because of fire, there is no place a germ can survive and spread the infections. And those 'vidude' (mouth pieces) are washed". (Male, 28 years old)

Even without being prompted by follow up questions, some participants had advices on what to use if you are a *Shisha* smoker.

A water pipe tobacco smoker aged 26 years and also a vendor of *Shisha* at Mwananyamala, had this advice for *Shisha* smokers out there:

"Milk really helps. If you don't drink milk, slowly and slowly you will start getting affected and eventually you get throat cancer."

Another smoker also volunteered an advice.

"They should always remember to drink water, because Shisha dehydrates you, it dries you so much. Inhaling the smoke and breathing dries up water. Shisha also reduce weight." (Male, 24 years old)

3.2.10 Health Problems

As already pointed out, nearly half of all participants had either heard or read about the health effects of water pipe tobacco smoking. But it should also be said that in several interviews the respondents mentioned the health problems they experience immediately after smoking the water pipe tobacco. Several reported experiencing vomiting, nausea, headache, and dizziness the first time they smoke water pipe tobacco. Two participants experience painful chest and back pain whenever they smoke, put they also pointed out that the pains are short term.

"For us Shisha smokers, most of us experience backbone pains and pains in the chest. Other health effect is back pain". (Male, 27 years old)

"I feel real good. The mind is at peace and the stress has gone, am real okay. Myself, when am angry, stressed or full of thoughts I feel good when I smoke. But should I tell you something sister? Shisha is not good if you are hungry, you must eat and have a

> *full stomach because if you are hungry and you smoke Shisha you may vomit of feel real bad".* (Male, 24 years old)

Five participants, three female and two males, talked about the immediate effects the water pipe tobacco smoking has on their libido. Whenever they smoke, they pointed out; they experienced a much reduced sexual drive i.e. low libido. A surprising thing, however, about this finding is the observation that the female respondents were happy and okay about this but males were not okay at all about this effect and one male would drink alcohol to boost his sexual drive.

A young lady was quoted as saying:

> *"The good thing about Shisha is that, it removes the urge of being with a man. So you drink smoke then sleep peaceful"*. (Female, 21 years old)

There were those who despite experiencing short term health effects of smoking still believed water pipe tobacco smoking was safe.

For others who were relatively knowledgeable about health problems associated with water pipe tobacco smoking, stop smoking or quitting was not something imminent. Long term health problems were not deterrence at all. They had a number of excuses for not quitting, prominent among these was addiction.

3.2.11 Water pipe tobacco, Cigarettes and Marijuana

The smoking of cigarettes and marijuana in relation to the use of water pipe tobacco was among the dominant themes. There was a tendency among water pipe tobacco smokers to either compare, contrast or even justify their behavior of smoking the water pipe tobacco with that of using cigarettes and marijuana. The points of contrasts and comparison were in various issues, prominent among them were the addiction, smoking frequency, smell and flavors, smoke lightness, harm, the "buzz" or "the high" etc..

On addiction, there were those participants who had pointed out that water pipe tobacco had no health effects these also assured the researcher that water pipe tobacco smoking was not

addictive. But there were those who said the addiction of water pipe tobacco was the same as that of cigarettes, among these were those who also smoke cigarettes.

The following verbatim describes:

> *"The urge to smoke is the same as that of a cigarette smoker. If you were so thoughtful, when you smoke, the head becomes empty*." (Male, 23 years old)

At least four other smokers did mention that water pipe tobacco is addictive but they pointed out that the addiction was totally different from that of cigarettes. To these smokers, there is urge or the cravings to smoke, but not every day or every hour like cigarette smokers.

> *"You became addicted just like in cigarette smoking but it takes time, the frequency is different. You smoke today (Saturday) then you may smoke again in Tuesday and Friday. You smoke cigarette anytime, actually you can smoke the whole pack and then add another one (packet)"*. (Male, 26 years)

Another smoker, university student had the same observation:

> *"Yes, it is addictive but not the same as cigarettes. You smoke once per week and it is enough*." (Male, 22 years old).

Most of the water pipe smokers interviewed liked the flavors and each had a specific favorite flavor. Some pointed out that they cannot smoke cigarettes because of absence of fruit flavors and the bad smell of cigarettes.

> *"I see Shisha smokers as classical but cigarette smokers! I wish I could tell them to stop smoking. Cigarette smell is boring and very bad"* (Male, 21 years old).

Another verbatim is from a lady of 20 years. She had this to say:

> *"Its pleasure to smoke, the flavor you get in the mouth is sweet, it is not like cigarettes. Cigarette is bitter and its smell is harsh".*

For most of the participants, male and female, cigarettes are more harmful compared to water pipe tobacco smoking. They pointed out various reasons for this perceived effect of *Shisha* smoking. While some insisted that Shisha has no tobacco, others said cigarettes are smoked directly (smoke does not go through the water) other reasons are as listed in table 2 below. Indeed one participant was categorical and went as far as describing nicotine levels in *Shisha*

as being very low compared to cigarettes. According to a *Shisha* vendor interviewed, the volume of nicotine in *Shisha* is 'only' 0.005.

Table 3: Reasons for perceived safety of Shisha

Sr No	**Reasons**
1	*Shisha* has no tobacco
2	Filtration of nicotine and other poisons in *Shisha* smoke by water
3	*Shisha* smoke has no nicotine
4	Low frequency of *Shisha* smoking i.e. not every day like cigarettes
5	Nicotine level in *Shisha* is low compared to cigarettes
6	Lightness and smoothness of *Shisha* smoke
7	*Shisha* smoke goes through water but cigarettes are smoked directly

The following verbatim was from a male *Shisha* vendor aged 25 years old in Sinza:

> *"But Shisha is a sweet smoke different from cigarette smoking, if you are a cigarette smoker you can easily differentiate Shisha smoke from a cigarette one, Shisha smoke is light because of water. If you smoke Shisha you don't experience a painful throat in the morning but if you smoke ten or fifteen cigarettes you get a painful throat, but you can smoke seven to eight Shisha and don't experience that".*

The same smoker had this to add:

> *"Its nicotine does not touch your blood that much compared to cigarettes. If you smoke too much cigarettes you feel thirst. Cigarettes bring the same thirst like thirst for*

water. But Shisha is not like that, you can smoke it today then wait until next week. That's why people like smoking Shisha"

Others compared the effects of water pipe tobacco smoking with those of cigarettes, they specifically mention lung disease, cancer and TB. But five respondents, all males, pointed out that water pipe tobacco smoking was more dangerous than cigarettes smoking, one smoker mentioned that more chemicals are used in *Shisha* compared to cigarettes, others referred to internet as the source of their information and the fact that the volume of smoke inhaled in water pipe smoking is far higher than that in cigarette smoking.

"First, this (Shisha) has more health effects than cigarettes. I tried to search in Google, the health effects are like hurting the lungs, then sharing the pipe with a friend, you see you don't know what he is suffering from, I might I have tuberculosis. That is according to internet" (Male, 26 years old).

A college student, a male aged 22 years, had this to say:

"Yes it has the same health effects as cigarettes, according to the internet; one puff is equal to 100 cigarettes"

One Shisha smoker, a male aged 24 years, was of the same view but slightly different as captured in the following verbatim:

"Shisha is better than cigarettes if you use it properly but you use it wrongly it becomes dangerous than cigarettes. Because smoking this (Shisha) once is the same as smoking 20 cigarettes that is one packet of cigarettes. If you smoke it within a recommended time its okay, you exceed it is dangerous".

Two study participants decided to smoke water pipe tobacco because they were already cigarette smokers and they found the water pipe tobacco to have the same "high" or "buzz" like cigarettes. But another study participant also a cigarette smoker had decided to start smoking water pipe tobacco because he thought it was just like other fags.

The issue of Marijuana was raised several times in the interviews. Some participants pointed out they were aware that in some *Shisha* selling joints *Shisha* was being mixed with Marijuana to make it more potent. Other respondents compared the high, buzz or *stimu* as they call it in *Shisha* as the same as that found in marijuana smoking.

Other respondents, male and female took their time to differentiate water pipe tobacco smoking and marijuana smoking.

> *"It is some kind of pleasure, but it is not like someone smoking Marijuana. Everything has negative and positive sides. What we are doing here is setting aside our knowledge; we don't see that negative side".* (Male, 27 years)

A lady, 33 years old with over two years of water pipe tobacco smoking experience was quoted as saying:

> *"It is just an intoxicant like any other intoxicants, let's say like alcohol, it something which has been allowed to be sold in public. I don't think it is something dangerous like Marijuana or narcotic drugs. It is being sold in public not in hiding, it is in the open. If it has health effects then it might be like cigarettes, that is, something which might not be morally wrong but in terms of health it is wrong. Morally it (smoking Shisha) is right".*

3.2.12 Social and Cultural Context of *Shisha* smoking

As already pointed out, majority of water pipe tobacco smokers started to smoke because of peer pressure or friends influence. Social context was not only crucial in experimentation and the eventual initiation, but also smoking water pipe tobacco for most of the respondents is a social activity. Most of the participants are still smoking Water pipe tobacco with their friends long after initiation. They meet especially in the evenings and over the weekends in places where water pipe tobacco is sold, as they talk, they buy drinks and smoke *Shisha* together.

But there are participants whose relatives disapprove the smoking of water pipe tobacco. These would normally smoke in secrecy with friends. One smoke describes that in the following verbatim:

> *"In my family that is a very big war, they completely don't want to hear that that I smoke Shisha because they think it is a narcotic drug. I have many friends whom I smoke with. When you have a friend and you like each other and he wants to try you cannot stop him*." (Male, 24 years old)

But several other participants have proceeded to teach their relatives and spouses how to smoke and whenever circumstances allow they smoke together. One study participant had this to say:

> *"My relatives and friends regards my smoking as normal, others are also smoking. I have also taught others, example my girlfriend"* (male, 20 years old)

In numerous occasions the social context of water pipe smoking was seen as going hand in hand with the cultural context. For several participants especially those with Arabic and Indian ancestry and those from Zanzibar, Water pipe tobacco smoking is part of their culture , they were born in that culture were parents, relatives and family are smoking the water pipe tobacco.

A male respondent, 23 years old with an Arab ethnic background was quoted as saying:

> *"I have an Arab ancestry, at home this is our tradition. So at our home some of my relatives have had Shisha for a long time"*

Asked, how he started to smoke, he had this to say:

> *"My father is good user of Shisha, so we started slowly at home then later on I continued smoking. At home the family members would just sit together and smoke Shisha".*

Another male smoker who is hailing from Zanzibar had this to say about his family home and smoking:

> *"It is the environment; I grew up and find my home had this environment of Shisha smoking. When it's known that you are using this intoxicant (kilevi), ahaa! They give you the okay and accept it* "(Male, 24 years old with 6 years of water pipe tobacco smoking experience)

One more respondent, a college student and residing in Namanga Street had this to say about his relatives and water pipe tobacco smoking:

> *"For my relatives it is like food so it is something normal. At home they smoke though they refused us to do so until I learn to smoke it myself at Slipway"* (Male, 25 years old)

Because of cultural and ethnic background, a total of six participants, five males and one female, learned how to smoke water pipe tobacco at home where parents and other relatives are also water pipe tobacco smokers.

The cultural heritage of water pipe tobacco smoking among Arabs and Indians had a direct role of smoking initiation for others who are neither Arabs nor Indians.

Two respondents were taught how to smoke *Shisha* by their Indian friends. Another smoker was taught about *Shisha* by his Arab friends. But there were others, three participants, all males, who either saw Arabs or Indians smoke at places of work, particularly in hotels and restaurants.

> *"I knew Shisha at my place of work. I used to drive my colleagues and foreign guests. One of my colleagues was an Arab, he was a chef, both of us like football so during the football matches I would do go to their apartment to watch the match and one of his pleasures was smoking Shisha. So I came to know Shisha and he started to give it to me. So I was smoking because by then I had not seen it anywhere else*." (Male, 28 years old).

A lady who lives in Mwananyamala had this to say about her Indian friends:

"I used to go to entertainment places like Slipway and I had Indian friends who were using it that's how I came to know about it".(Female,24 years old with two years experience of water pipe tobacco smoking)

CHAPTER FOUR

4.0 DISCUSSION

This chapter includes a discussion of the results relative to the reviewed literature, research objectives and proposed research questions. It is organized into the following sections: discussion of the results, study limitations, conclusion and recommendations.

4.1 Local beliefs related to Water pipe tobacco smoking among young smokers

The participants had various beliefs about the smoking of the water pipe tobacco. As much as these beliefs were localized, they were also beliefs shared by other smokers of the water pipe tobacco in various places of the world were the water pipe tobacco is smoked particularly in the Middle East.

Though 45% of the participants knew that water pipe tobacco smoking had health effects quite a sizeable number believed that water pipe tobacco smoking had no health effects and others believed that water pipe tobacco smoking was less harmful compared to cigarettes.

There were others who though knew that *Shisha* had tobacco; they believed that its nicotine and poisons were filtered by water. The reasons behind this belief were like, lightness and smoothness of the smoke, fruit flavored smoke, less nicotine, absence of nicotine and filtration property of the water in the bowl.

The beliefs were also propelled by misperceptions, misconceptions, tobacco naivety and a lack of the adequate knowledge on the water pipe tobacco smoking.

The belief that the water pipe tobacco smoking is less harmful than cigarette smoking has also been reported in other studies. According to Al Naggar et al. (2011), regarding the knowledge among the study participants, the majority of the participants (48%) mentioned that *Shisha* is less harmful than cigarettes. Also Maziak et al. (2004) reported that 89% of the participants thought that Shisha is less harmful than cigarettes. A similar study from Syria reported that 30% of the university students were of the opinion that Shisha was less harmful than cigarettes (Maziak et al., 2004). Al Naggar et al. (2011) reported that there has been false perceptions

that *Shisha* smoking is safer than cigarette smoking because the invention of *shisha* smoking involves the passage of the smoke through water that is presumed to filter the smoke and remove the toxic agents.(Kandela,2000;WHO,2005;DAWN,2006).

The other belief is on the nicotine, participants especially females believed that water pipe tobacco has no nicotine, and other respondents believed that the nicotine levels in water pipe tobacco were far small. There were also those who believed water in the bowl was filtering the nicotine and making the water pipe tobacco much safe to smoke. This finding is supported by other studies done in the Middle East. The increasing trend of *Shisha* smoking is due to some misconceptions regarding *Shisha* smoking, for example nicotine content in *Shisha* is lower than that in cigarettes and water filters out all the toxic chemicals including tar, carbon monoxide and nicotine (Maziak et al., 2004). But other studies have shown that Shisha smoke contains many of the same toxicants as cigarette smoke (Shihadeh, 2003; Shihadeh and Saleh, 2005). Not surprisingly carbon monoxide is found in *Shisha* users' breath (Shafagoj and Mohamed 2002; Ward et al., 2006; Chaouchi, 2007) and nicotine is found in their blood, (Shafagoj et al.,2002) to the extent that blood nicotine of a daily Shisha smoker user is similar to that of an individual who smokes cigarettes (Maziak et al.,2004). In reality, *Shisha* has a nicotine content of 2% to 4%, whereas cigarettes have a nicotine content of 1% to 3% (Kiter et al., 2000; Knishkowy and Amitai, 2005).

A small number of participants especially those who are regular smokers of water pipe tobacco knew that *Shisha* was addictive and some of these actually claimed to have been addicted. But others believed that water pipe tobacco was not addictive. This finding is supported by other studies which reported that most smokers do not see themselves as addicts and the feeling that they can quit whenever they wanted to was a common perception among *Shisha* users (Ward et al., 2007; Smith- Smione et al., 2008).

Findings reveal that majority of respondents were able to mention various health effects caused by the smoking of water pipe tobacco. Examples of these effects were various cancers and Tuberculosis. However there was a common belief that these effects including

Tuberculosis will only happen after long time use of the water pipe tobacco. While long term use of tobacco is truly associated with various forms of cancers, lung disease, cardiovascular diseases but it should be said that not all health effects required long term use to occur or attack individuals e.g. Tuberculosis, oral Herpes and Helicobacter pylori. Sharing a hose of water pipe with a person infected with TB may led to the spread of infection to other *Shisha* user even it is just a single smoking session. Prignot et al. (2008) noted that water pipe smoking was a contributor to the spread of Tuberculosis by infected persons who shared a mouth piece with non infected individuals during a smoking session. But a serious question for participants in the current study is how much is too much and how long is too long.

4.2 Attitudes of young smokers on water pipe tobacco smoking

Attitude is defined as a person's negative or positive judgment of a behavior (Ajzen& Fishbein, 1980). Attitudes of individuals are informed by beliefs, perceptions and knowledge. The majority of participants were aware of the health effects of water pipe tobacco smoking, they had either heard or been told by fellow smokers, or they had read about them in the internet. There were those who were knowledgeable about specific health effects and those who didn't know the specific health effects but had at least heard the water pipe smoking had health effects. Despite this level of knowledge, generally the attitudes towards water pipe tobacco smoking were positive and favorable. The reasons for this could be explained by various reasons, these include; perceptions of the health effects, wrong beliefs and lack of knowledge on the contents and the health effects of water pipe tobacco smoking.

Perceptions of the health effects among the respondents are misguided. participants are regarding the health effects like relaxation, getting high, head rush, addiction, reduced sexual drive and others not as impairments but as benefits of water pipe tobacco smoking.

There are also false beliefs about water pipe tobacco smoking. For some participants, the smoking of *Shisha* is safe, cigarette smoking is more harmful than *Shisha* smoking, *Shisha* is not addictive, you get tuberculosis after using *Shisha* for a long time, *Shisha* has no nicotine, the level of nicotine are far lower, the water in the bowl is filtering the nicotine and other

poisons etc..People who believe things like these are unlikely to have negative attitudes towards water pipe tobacco smoking.

There were those participants who do not know the contents and the health effects of water pipe smoking. And there are those who do not only lack the knowledge on the health effects of *Shisha* smoking but they also do not care. For them, it is about pleasure seeking, socialization and other benefits of *Shisha* smoking.

So for majority of participants, water pipe tobacco smoking is pleasure, relaxing, luxurious, and entertaining, stress and tension reliever, leisure, social activity etc...These findings are in agreement with findings in a study conducted in Saudi Arabia on harm perception, attitudes and predictors of water pipe smoking among secondary School adolescents. In that Saudi Arabia study, Amin et al.(2010) reported that of the included students,52.1% agreed that water pipe smoking was more socially acceptable than cigarettes,33.8% believed that smoking of water pipe represents a good opportunity for gathering of friends and family,29.8 mentioned that their parents would not object their water pipe use,37.8% believed that smoking of water pipe can relieve stress and tensions,38.5% will prefer water pipe if they were to smoke because of less harm and addictive properties compared to cigarettes.

Those participants who are aware of the long term adverse effects were scared of *Shisha* smoking. Some regarded the effects as something of a distant future or resulting from a long term and excessive use of the water pipe tobacco. It was intriguing because one would have expected that these smokers will have negative attitudes on *Shisha* smoking but this was not the case, even those who were aware that water pipe smoking was potentially harmful than cigarette smoking were also talking positively about *Shisha* and had real favorable attitudes about it.

These knowledgeable smokers defy the expectations one will have on their attitudes. Khor et al.(2006) have an insight on this observation, “knowledge, attitude and practice are conceptually interrelated in human behavior. Having the right knowledge ,while important , is insufficient in influencing attitudes as well as human behavior .Although smokers have a high

knowledge of the health consequences of smoking they also possessed more favorable attitudes towards smoking. Study results show that having the correct knowledge or beliefs does not always translate into the right attitude and practice."

4.3 Meanings attached to water pipe tobacco smoking by the young smokers

Participants attached various meanings to water pipe tobacco smoking. For most of the respondents, water pipe tobacco smoking is a relaxation, pleasure, entertainment, refreshment. For other respondents, water pipe tobacco smoking is a stress reliever, leisure, a way of passing time, boredom remover and a calming effect. Some of these findings are supported by a recent study done in Pakistan which showed that curiosity followed by pleasure seeking and boredom were the most important factors in starting water pipe tobacco smoking. In Pakistan, university students' curiosity was found to be the most common reason followed by pleasure seeking, peer pressure, boredom and stress for initiation of Shisha smoking (Jawaid et al., 2008). But there were other respondents who see water pipe tobacco smoking just as a fashion like any other fashions.

For participants who were initiated into smoking by friends i.e. peer pressure, water pipe tobacco is a social activity where friends meet together, talk and share the water pipe tobacco. A study in Saudi Arabia collaborate this finding, in that study, primary motives for water pipe tobacco smoking were outings with friends, company, boredom and wasting time (Amin et al.,2010).

For participants with Arab and Indian ancestry, water pipe tobacco smoking is a part of their cultural heritage as they mentioned several times in the interviews that *Shisha* smoking is our culture, our tradition. *Shisha* smoking is also a social and a communal activity. When smoking at home, water pipe tobacco smoking brings together the family, relatives, and others who smoke together the water pipe. This is supported by findings in the study done in United Kingdom by Roskin and Averyard, (2009); they put it this way, "those smoked at home described smoking water pipes whilst chatting or watching television. Whatever the setting, the water pipe was a focal point enhancing the social atmosphere. It was an inclusive activity

that would be casually commenced and would continue until late at night. For many, it was appealing to be able to smoke intermittently with breaks whilst the pipe was passed around (Roskin and Aveyard, 2009).In India, if a person does not share the mouthpiece it is considered an offence (Maziak, Ward, Afifi, Soweid, & Eissenberg, 2004). This shows the cultural and social significance of sharing a water pipe tobacco apparatus among relatives and family.

This finding has implications for public health practice, advocacy, and research in the area of smoking. Designing of prevention, treatment and policy strategies for Shisha smokers should take into consideration cultural values, cultural heritage and social norms. Health messages should be shaped to address aspects of culture which are harmful.

4.4 Social determinants associated with water pipe tobacco smoking among the young smokers

The social determinants of health are the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels (WHO). The analysis of the interviews showed the role played by the social determinants in influencing and motivating individuals to smoke the water pipe tobacco. According to Martinasek, (2011) social determinants consist of an individual's perceptions of surrounding significant people that influence the performance of behavior and the individual's motivation to comply with these perceptions.

In the current study more than a half of all participants were influenced to start smoking the water pipe tobacco by either friends or family members. Though it were difficult to say for sure if it were relatives or friends who were the first to expose and influence the smokers for the first time or if it were other totally different factors, it is obvious the significant others had played a role. These findings are in agreement with other studies done in the Middle East and other places in the world. It has been shown that hookah (*Shisha*) smoking behavior among parents (Dar-Odeh et al., 2010), people in the close family circle (Anjum et al., 2010) has a

significant association with the smoking status of the individual. But it should be said here that, the motivation and the initiation of water pipe tobacco smoking might be a result of the interplay of the various factors which sometime even a smoker himself or herself might not be able to pin point or isolate.

According to Center for Disease Control and Prevention (CDC) of the Unites States of America, Social determinants of health are factors in the social environment that contribute to or detract from the health of individuals and communities. These factors include, but are not limited to the following:

- Socioeconomic status
- Transportation
- Housing
- Access to services
- Discrimination by social grouping (e.g., race, gender, or class)
- Social or environmental stressors

Socio economic status as mentioned above is a factor which through its different aspects like education level, individual and family monthly income and occupation may influence or may not influence smoking of water pipe tobacco.

Participants are young men and women of different levels of education, different occupation and monthly income. The findings of this study show most of the respondents with relatively low level of education, low and unreliable income and extremely low level of employment. Employment status and financial stress according to studies are risk factors for smoking among young adults. Young adults who are unemployed are more likely to be current, daily and heavy smokers (Now et al., 2000; Merline et al., 2004; Lawrence et al., 2007). One study in Misurata, Libya by Sugathan et al. (2010) on socio-economic correlates of *Shisha* or water pipe smoking had slightly different findings, it reported that majority of the hookah or water pipe users (68.8%) were of high income group. Those with lower income started hookah smoking, at an earlier age (p less than .001). Duration of use was significantly higher in the

low income group. Most of the Hookah smokers in this study were having high education (75%). Smokers with lower education level started the Hookah smoking at younger age ($p <$ 00.1) and the duration of Hookah use was higher among primary school education group ($p <$ than 001). Therefore low education and low income was significantly associated with early initiation and long duration of Hookah usage (Sugathan et al., 2010).

Unemployment and poverty are likely to push a person into depression, stress and boredom, situations which can easily push an individual into smoking. But there is another side of the same argument, that is, high income of the individual or his family can enable a person to easily purchase water pipe tobacco and eventually become an addict. Significant economic growth, job creation and improvement of people welfare in education and health are needed to reduce a number of smokers.

4.5 Perceived health effects of water pipe tobacco smoking among the young smokers

The first time experimentation with water pipe tobacco smoking for majority of participants was unpleasant. As they smoke the water pipe for the first time respondents reported to have felt nausea, dizziness, sudden body weakness, vomiting, choking on the smoke, headaches, others reported fever and sudden hunger and light headiness. Even after initiation of smoking participants still experience short term health effects like painful chest, back pain, tightness in the chest, sore throats, reduced sexual drive etc. But listening to respondents interviews, it was obvious that they did not perceive these health effects as something serious and a warning of possible future problems. They did not seem to recognize the fact these health effects could be predecessors and precursors of serious health effects. Griffiths et al. (2011) had similar findings in their qualitative study of beliefs and attitudes of young *Shisha* smokers in United States of America, they report this ; “misguidedly, participants in his study associate the light headedness or slight headaches as short term effects with lasting implications”.

A number of participants, both male and females, reported reduced sexual drive or low libido after smoking the water pipe tobacco. For male participants this was not a good thing and at

least one respondent was using alcohol, specifically beers, to boost his sexual drive. But female participants perceived this health effect as beneficial, they don't need men after smoking so they are at peace and sleep easily.

Participants also did not regard the relaxation, "the buzz", "the high", or the head rush (light headiness) as health effects or impairments but rather the benefits of water pipe tobacco smoking. They discount these feelings as side effects of smoking. This finding is in agreement with other studies on behavioral beliefs and perceptions of smokers. According to Griffiths et al. (2011), the description of feeling a buzz, head rush or high is similar to the effect of alcohol, but the participants perceive the effects as relaxation rather than impairment. Participants' descriptions of relaxation during and after Hookah (*Shisha*) smoking imply positive mental and even physical benefits, furthering positive associations with health.

Griffiths et al. (2011) still on the issue of perceptions, continue to provide an insight, they say "although research on the effects of Hookah (*Shisha*) smoking on cognitive abilities is not available, research on cigarette smoking suggests that smoking does affect concentration and memory. Jacobsen et al. (2005) compare teen smokers with non smokers and find that smokers experience impaired cognitive function, particular the accuracy of working memory performance.

It should be said however, that, not all respondents were misguided in their perceptions or had misperceptions of the health effects. A sizable number of participants had the right perceptions of health effects but this obviously is not deterring them from smoking *Shisha*. One of the World Bank reports (The World Bank, 1999) succinctly mentioned the same kind of situation when it comes to health risks of smoking, the report says, even when individuals have reasonably accurate perception of the health risks faced by smokers as a group, they minimize the personal relevance of this information, believing other smokers' risks to be greater than their own. The report further reiterated that young people under estimate the risk of becoming addicted to nicotine and therefore grossly under estimate their future costs from smoking.

The perceptions of long term health effects were more or less the same as those of short term or immediate health effects. Participants did not perceive the long term effects as a real danger for most of the participants 'were told' that those effects will come or occur after a long term use of water pipe tobacco and since these respondents pointed out that they smoke once or twice in a week or on monthly basis, the danger was unrealistic. Khor et al. (2006) in the study of the factors associated with tobacco use among female students had this to say regarding the way the health problems and risks are perceived, "It is difficult for youth to imagine the damage on their health in some distant year as compared to the immediate gratification of the present".

Perceptions, attitudes and beliefs of young men and women in Tanzania regarding water pipe tobacco use need to be addressed i.e. corrected so that they understand and real appreciate the health risks and consequences associated with tobacco use. Interventions are required to equip the youth to make informed decisions about water pipe tobacco use.

5.0 Study Limitations

This study was conducted in Kinondoni Municipality and the sample was young water pipe tobacco smokers aged between 15 and 35 years. The results of the study like any other qualitative study cannot be generalized to the other municipalities or the general population. However the number of study participants and socio demographic characteristics of study participants represent the major socio-demographic characteristics of the population of Dar es Salaam. It is my hope that the findings will give an insight into the current situation of water pipe tobacco smoking in the City.

Social desirability is another possible limitation of this study. The study participants or the interviewees may have provided the answers they believe the interviewer wanted to hear. To avoid or minimize this expression of social desirability, the researcher and his assistant avoided giving cues like facial expressions and also not show approval or disapproval of participants' opinions and views during data collection.

Several participants refused to participates especially when they were told that their voices will be recorded and despite the fact that there was an alternative option of recording their responses they still refused. Also most of the research participants were male. This distribution might suggest that more young men than young women are likely to be *Shisha* smokers. Additional inquiry is warranted to provide sex disaggregated data of *Shisha* smokers. However the observation of researchers was that most of the *Shisha* users in the visited sites were males. Nevertheless, 44 semi structured interviews is a large number which has captured a large body of experiences, beliefs and perceptions.

Limited time, constrained financial resources and logistic difficulties prevented the researcher and his assistant from visiting the potential respondents who are smoking their water pipes at home and those smoking at very expensive hotels and *Shisha* parlors.

CHAPTER FIVE

6.0 CONCLUSION

The smoking of water pipe tobacco or *Shisha* is increasingly becoming popular among young men and young women in most cities and major towns of the country. The reasons for the growing popularity of this type of tobacco smoking are many but prominent among them are misguided beliefs, attitudes, perceptions, poor knowledge of the contents and effects of *Shisha* smoking, the rising availability and economic accessibility of the water pipe tobacco, a lenient tobacco control policy and lack of health information. Before water pipe tobacco smoking can become a serious problem of public health importance in the country, evidence-based public health and policy strategies are required to equip the youth and the whole public to make informed decisions about water pipe tobacco smoking.

6.1 RECOMMENDATIONS

There is an urgent need to educate the general public especially Tanzanian young men and young women about short and long term adverse health effects of water pipe tobacco smoking. It is very important that the toxicological and epidemiological evidence of the adverse effects of *Shisha* smoking should be presented to the public so that people change their beliefs, attitudes and perceptions.

The findings of this study are showing that, peer pressure and influence as a leading and most potent environmental force in motivating individuals to smoke water pipe tobacco. So in order to have effective programs, educational interventions aimed at young people should focus at reducing perceived peer acceptability and popularity.

The water pipes and water pipe tobacco must contain health warnings similar to those found on cigarette packs and advertisements. That is, water pipes and its tobacco should be subjected to the same regulations and laws as cigarettes and other tobacco products including banning *Shisha* smoking in public places such as bars, restaurants, night clubs and hotels. Graphic

health warnings on the water pipes, the tobacco and all the accessories should be graphic health warnings are strongly recommended. There is a need therefore to have a comprehensive tobacco control policy.

The authorities should increase taxation on water pipes and water pipe tobacco. Higher taxes will definitely raise the price and costs of the product. Studies have shown that price is one of the strongest influences on tobacco consumption and this is why pricing measures were included in the Framework Convention for Tobacco Control (FCTC). With increased costs of water pipe tobacco or *Shisha* the number of consumers will also be reduced and therefore stem the prevalence of water pipe tobacco smoking.

To the best of this researcher's knowledge, this is the first ever research to be conducted on water pipe tobacco smoking in Tanzania. It is obvious that further studies are required on the problem especially epidemiological studies on the health problems experienced by the water pipe tobacco smokers and country wide qualitative and quantitative studies to establish the magnitude and other factors associated with Shisha smoking among young population and other groups in society

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APPENDICES

Appendix 1: Interview guide

1. What is your age?

2. Where do you live in Dar es Salaam?

3. How would you classify your income?

5. Are you employed? Or unemployed?

4. What is your education level?

Smoking Status Questions

5. How did you know that there is water pipe (shisha) smoking?

6. How did you start smoking water pipe smoking?

7. Why do you smoke water pipe? (Socializing? Relaxation?, pleasure?or entertainment?)

Health knowledge Questions

8. What are the contents of *Shisha*?

9. What are the health effects of *Shisha* smoking?

Beliefs and Attitudes Questions

10. What are your beliefs about *shisha* smoking?

11. How do your relatives and friends perceive water pipe smoking?

Behavioural Belief Questions

12. What is normally your state of mind when you decide to smoke *shisha*?

13. How do feel during and after a session of water pipe smoking?

Affordability Question

14. How do you see the affordability of water pipe (*Shisha*)?

Availability Question

15. How do you see the availability of water pipe in recent years?

Sensory Qualities Questions

16. How do you see water pipe accessories, e.g. its shape, design and flavours

17. Do you have a favorite water pipe flavor? What is it? Why is it your favourite?

Appendix 2: Interview guide (in Swahili)

1. Una umrigani?
2. Unaishi sehemu gani Dar es Salaam?
3. Unakielezaje kipatochako cha mwezi?
4. Je una ajira?
5. Una kiwangogani cha elimu?
6. Ulifahamuje kwamba kuna uvutajiwa shisha
7. Ulianzaje kuvuta shisha?
8. Kwanini unavuta shisha?
9. Je unajua kilichomo kwenye shisha?
10. Je unafahamu kama shisha inamadhara au la?kama ndio,Nini madhara ya uvutajiwa shisha?
11. Nini imani zakokwenyeuvutajiwa shisha?
12. Ndugu zako na marafikizako wanaiona je au kuichukulia vipi tabia yako ya kuvuta shisha?
13. Hali yako kiakili huwa inakuwaje kabla ya kufanya maamuzi ya kwenda kuvuta shisha? Au kwa maneno mengine, ni msukumo gani wa kimawazo unaokupata?
14. Huwa unajisikiaje unapovutana baada ya kuvuta shisha?
15. Unazionaje gharama za kifedha za kuvuta shisha?
16. Unauonaje upatikanaji wa shisha kwenye miaka ya karibuni
17. Unavionaje vifaa vya shisha, kwa mfano, umbo, usanifu au ladha yamoshi?
18. Je kuna ladha ya moshi wa shisha unayoipenda zaidi? Ni ipi? Kwa Nini?

Appendix 3 Informed Consent (English Version)

Hello, my name is …….from Muhimbili University of Health and Allied Sciences.

I am currently a student in Master of Public Health degree program and as part of fulfillment for the award of this degree, I am supposed to conduct research and produce some findings which will be useful for myself, the university and the community as a whole.

Objective:

To gain an in-depth understanding of the factors related to water pipe smoking among youth in the general population

What participation involves;

If you agree to participate this study. You will be required to answer a series of questions that have been prepared for the study in order to obtain relevant information regarding the research objectives.

Confidentiality

All information that will be obtained will remain confidential and will be used only for the purpose of this study. You are not supposed to write down your name, but we will use only the identification number

Risks

You will be responding to questions pertaining to your understanding about *shisha* smoking. Feel free not to answer any particular question that you think you are not comfortable with. We do not expect any harm to happen to you because of participating in this study.

Benefits

Your participation in this study is valuable as the information obtained from you will enable the researcher to collect information will inform health researchers, policy makers and health practitioners to find the best way to educate the public on the health effects of Shisha smoking and improve people's health

In case of Injury

It is not anticipated that any harm will occur to you or your family as a result of participating in this study

Who to contact

For any clarification about this study do not hastate to contact the Principal Investigator Moses Stephen of P.O Box 650001 Dares-Salaam, Tel 0718 722667 or Dr. Ezekiel Mangi, Tel 0713788811 who is the supervisor of the study

Signature

Do you agree? :

Participant agree

Participant does not agree

I agree to participate in this study

Signature of Participant ……

Signature of Research Assistant……

Date of signed consent ……

Appendix 4: Informed consent: Kiswahili version

Habari, Naitwa Moses Stephen kutoka Chuo kikuu cha afya cha na sayansi shirikishi-Muhimbili.

Malengo ya utafiti

Tunafanya utafiti huu kama sehemu ya mahitaji ya kukamilisha program ya digrii ya pili ya afya ya umma (Public health)

Utafiti huu unalengo la kukusanya tarifa kuhusu uvataji wa shisha

Kama ukikubali, kushiriki yafuatayo yatatokea

Unaombwa kushiriki katika utafiti huu. Kama ukikubali kushiriki, utaulizwa maswali ambayo utayajibu kulingana na uelewa wako ili kusaidia kupata taarifa za kutimiza malengo ya utafiti.

Usiri

Taarifa utakazo zitoa zitatunzwa kwa usiri na zitatumika kwa malengo ya utafiti huu tu.Hautakiwi kuandika jina lako ilatutatumia namba ya utambulisho.
Unatakiwa kujibu maswali kutokana na uelewa wako kuhusiana na uvutaji wa shisha.Kuwa huru kutojibu swali lolote ambalo hujisikii kujibu.Hatutarajii kuwa utapata madhara yeyote kwa kushiriki kwenye utafiti huu.

Faida ya kushiriki katika utafiti

Kushiriki kwako katika utafiti huu kuna faida, kwani taarifa utakazozitoa zitawezesha watafiti, watunga sera na wataalum wa afya kuelewa nakutoa elimu kwa umma na mapendekezo ya namna ya kuboresha afya za wananchi.

Endapo utadhurika

Hatutegemei kuwa utapata madhara kwa kushiriki katika utafiti huu

Watu wa kuwasiliana nao

Kama una maswali kuhusu utafiti huu wasiliana na mratibu wa utafiti huuMoses Stephen of P.O Box 65001 Dares-Salaam, Tel 0718 722667 au wasiliana na Dr. Ezekiel Mangi, Tel 0713788811) ambaye ni msimamizi mkuu wa utafiti huu

Je unakubalikushiriki? …… (Ndiyo/hapana)

Sahihiyamshiriki ……

Sahihiyamshiriki……

Imesainiwaleotarehe…….

Appendix 5: Table of themes

Themes	**Sub themes**
1.Peer pressure	1.1. Social activity 1.2. Friendship 1.3. Company
2.Sensory qualities	2.1. Flavors 2.2. Shape 2.3. Design
3.Availability	3.1. Curiosity 3.2. Increasing exposure
4.Affordability	4.1. Cost sharing 4.2. Pipe sharing 4.3. Cheapness
5.Fashionable trend	5.1. Show off 5.2. Prestige 5.3. Status 5.4. Imitation
6.Relaxation	6.1. Refreshment 6.2. Entertainment 6.3. Luxury 6.4. Stress 6.5. Feeling low 6.6. Boredom 6.7. Pleasure 6.8. Leisure
7.Addiction	7.1. Smoking pattern 7.2. Weather 7.3. Occupation
8.Knowledge of water pipe tobacco smoking	8.1. Misconceptions 8.2. Ignorance
9.Health problems	10.2. Short term health effects 10.2.Long term health effects
10.Health Beliefs	10.1. Level of nicotine and its absence 10.2.Addiction 10.3 Harmfulness

11.Cultural and Social Context	11.1.Relatives and friends acceptability 11.2. Cultural heritage
12.Cigarettes, Shisha and Marijuana	12.1.Smoking frequency 12.2. Smoke lightness 12.3. The high, the buzz, the head rush 12.4. Health effects

Appendix 6: Research Permit