PREVALENCE, HABITS AND ATTITUDE TOWARDS TOBACCO USE AMONG HEALTH CARE PROFESSIONALS

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PREVALENCE, HABITS AND ATTITUDE TOWARDS TOBACCO USE AMONG HEALTH CARE PROFESSIONALS

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CERTIFICATE

This is to certify that the thesis entitled **"Prevalence, habits and attitude towards tobacco use among health care professionals"** submitted to Mizoram University for the award of the degree of Doctor of Philosophy in Nursing by C. Lalramdini is a record of original research work carried out during the period of 2020-2024 under our guidance and supervision, it has not been submitted for award of any degree in this or any other University or Institute of learning.

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I, C. Lalramdini, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University / Institute.

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INTRODUCTION

1.1: Background of the study:

The world's leading preventable cause of mortality at the moment is tobacco usage. It already claims the lives of 5.4 million people annually, and by 2030, if unchecked, that figure could rise to almost 8 million. Due to the hazardous nature of tobacco in all its forms, there is no safe level of exposure. Cigarette smoking is the most common method of tobacco use. Additional tobacco products include of waterpipe tobacco, bidis, kreteks, cigars, cigarillos, roll-your-own tobacco, pipe tobacco, and different smokeless tobacco products (WHO, 2009).

The usage of smokeless tobacco is very unhealthy and addicting. Use of smokeless tobacco products raises the risk of certain dental disorders as well as malignancies of the oesophagus, pancreas, lungs, and oral cavity (including cancer of the mouth, tongue, lip, and gums). Smokeless tobacco products are a major source of carcinogenic nitrosamines (Boffeta et al. 2008).

Cigarette smoking harms nearly every organ in the body, and smoking is the leading preventable cause of premature death in the United States. Although rates of smoking have declined, it is estimated that it leads to about 480,000 deaths yearly. Smokers aged 60 and older have a two-fold increase in mortality compared with those who have never smoked, dying an estimated 6 years earlier. Quitting smoking results in immediate health benefits, and some or all of the reduced life expectancy can be recovered depending on the age a person quits (NIDA, 2020).

Although nicotine itself does not cause cancer, at least 69 chemicals in tobacco smoke are carcinogenic, and cigarette smoking accounts for at least 30 percent of all cancer deaths. The overall rates of death from cancer are twice as high among smokers as nonsmokers, with heavy smokers having four times greater risk of death from cancer than nonsmokers (NIDA, 2024).

Many cancers are caused by tobacco use, including acute myeloid leukaemia and cancers of the mouth, throat, larynx (voice box), bladder, kidney, liver, stomach, pancreas, colon, rectum and cervix. An elevated risk of pancreatic, oesophageal and oral cancer exists in smokers who use smokeless tobacco (chewing tobacco or snuff).

Use of tobacco product is never safe. Quitting is highly recommended for anyone who uses tobacco products of any kind. When compared to those who continue to smoke, people who quit smoking, regardless of age, have significantly longer life expectancies. Furthermore, the chance of mortality is decreased by stopping smoking as soon as cancer is diagnosed (National Cancer Institute, 2017).

The world's cancer morbidity and mortality rates are significantly increased by smokeless tobacco usage. Although figures related to ischemic heart disease should be evaluated more carefully, they nevertheless demonstrate a sizable predicted disease burden. As part of its Framework Convention for Tobacco Control, the World Health Organization must consider regulating smokeless tobacco (Siddiqi et al. 2015).

In a meta-analysis, according to Gupta et al. (2019), shows that there is a worldwide link between the use of smokeless tobacco and coronary heart disease (CHD). Most people know that smoking can lead to cancer. It can damage many different organs, including the heart, blood vessels, mouth, skin, eyes, and bones, but the most common ones are the lungs, heart, and reproductive organs. Generally speaking, smokers die ten years earlier than non-smokers.

It is mandatory for all parties involved in the Framework Convention on Tobacco Control (FCTC) of the World Health Organisation (WHO) to implement measures aimed at reducing the demand for tobacco products. This article also recommends prominent, visible health warnings and advocates for the use of more effective means of disclosure about components and emissions. According to Article 11, packaging for tobacco products must include health warnings outlining the negative consequences of smoking as well as other pertinent information to educate consumers about the risks associated with using tobacco products (Bekki et al. 2015).

According to a 2013 Institute for Global Tobacco Control recommendation, tobacco product health warning labels should occupy at least 50% of the pack's front. India's public health legislation, the Cigarette and Other Tobacco Products (Prohibition on Advertisement and Regulation of Trade and Commerce, Production,

Supply, and Distribution) Act, 2003 (COTPA), incorporated the primary goals of the Framework Convention on Tobacco Control (FCTC) by outlawing and discouraging the use of tobacco products. All tobacco products must have visual warnings displayed on them, as required by Section 7 of the Act. Additionally, the legislation forbids the sale or import of tobacco goods without the required warnings (Arora & Yadav, 2010).

Tobacco usage continues to be the world's leading preventable cause of death. The list of illnesses linked to tobacco usage has grown as more people become affected by the disease and as research and findings demonstrate the detrimental effects of smoking on one's health. Periodontitis, cataracts, acute myeloid leukaemia, abdominal aortic aneurysm, stomach cancer, pancreatic cancer, kidney cancer, cervical cancer, and more diseases are now included in the list. But those who are negatively impacted by tobacco smoking are not the only ones. Secondhand smoke, also referred to as passive smoking, affects millions of people worldwide, including half of all children (WHO, 2005).

Tobacco consumption is still on the rise in India. The continuous assessment of cigarette use trends will support the creation of effective tobacco control initiatives. Most large studies have limitations because of data that was submitted by a household member. Studies conducted in communities that gather information from every participant at different times will be a more reliable source of data for understanding trends (Mohan et al. 2018).

In India, 28.6% of adults 15 years of age and older currently use tobacco in any form. The report goes on to say that 3.2 crore adults use tobacco products twice a day. While every tenth adult (10.0 crore) smokes tobacco, every fifth adult (19.9 crore) uses smokeless tobacco. Given the high rate, the nation should be concerned. The same source offers stunning and alarming statistics about Mizoram's state. Of the adult population, 64.9% of men, 52.4% of women, and 58.7% of women smoke or use smokeless tobacco. Currently, 34.4% of the population, 14.3% of women, and 54.1% of males smoke as adults. Smokeless tobacco consumption is 33.5% among adults overall, 46.0% among women, and 21.3% among men (GATS 2, 2016-17).

Mizoram, a state in northeastern India, has a very high age-adjusted incidence of stomach cancer. Hospital-based case-control investigation was carried out to investigate the effect of cigarette smoking on the risk of stomach cancer in Mizoram. The odds ratio (OR), 2.3; 95% confidence interval (95% CI), 1.4-8.4, demonstrated that current smokers had a significantly higher risk of stomach cancer than non-smokers. The hazards were higher for meizial (OR, 2.2; 95% CI, 1.3-9.3) smokers, who used a regional cigarette. A higher risk was associated with subjects who had smoked for more than 30 years (Phukan et al. 2005).

Smoking, consuming betel nuts, and tuibur (water flavoured with tobacco smoke) all increased the risk of stomach cancer. An increased risk of stomach cancer was associated with both the GSTM1 null genotype and the GSTT1 non-null genotype The study concludes that in Mizoram, smoking tobacco, especially meizial, is a major risk factor for stomach cancer. The effects of tobacco usage are modified by the GSTM1 and GSTT1 genes. Thanks to this study, the epidemiology of stomach cancer in Mizoram, India, is better understood (Malakar et al. 2012).

The following categories are used by the International Labour Organisation (ILO) to classify health professionals: 1. Physicians; 2. Midwives and nurses; 3. Practitioners of alternative and traditional medicine; 4. Paramedical personnel; and 5. Veterinarians. 6. Other health care providers include optometrists, ophthalmic opticians, dieticians and nutritionists, physiotherapists, dentists, chemists, environmental and occupational health and hygiene specialists, and audiologists and speech therapists (ISCO-08, 2012).

Health professions include those in the fields of dentistry, medicine, midwifery, nursing, nutrition, occupational therapy, pharmacy, physical education, physiotherapy, psychology, social work, and speech therapy, according to a study by Sangaleti et al. (2017). Community health workers, nursing assistants, licenced practical nurses, and other allied health workers were also included in addition to these professionals.

Health professionals can make a big difference when it comes to helping their clients and themselves quit smoking. Numerous international studies have demonstrated the high incidence of tobacco use among medical practitioners. Given their crucial role in helping people quit smoking as both advisors and behavioral role models for the public, it is vital to evaluate the prevalence, behaviors, and attitudes toward tobacco use among health professionals. Finding out how medical professionals view themselves as potential resources for those seeking to give up smoking is also crucial (Hussain, 1993).

A systematic review and meta-analysis conducted by Nilan et al. (2019) on 229 articles that satisfied the inclusion criteria revealed that out of the 63 nations and 457,415 healthcare workers (HCW), 29 were high-income (HIC), 21 were upper-middle-income (UMIC), and 13 were lower-middle and low-income (LMLIC). With 31% of men and 17% of women, 21% of HCWs overall admitted to smoking cigarettes. The highest estimates for male doctors in LMLIC and UMIC were 35% and 45%, respectively. The highest estimates for female nurses in HIC and UMIC were 21% and 25%, respectively. Additional study results indicate that tobacco smoking is still common among healthcare professionals (HCWs). Prompt action must be taken because healthcare workers (HCWs) are the ones addressing tobacco usage among their patients.

Singh et al.'s (2010) study highlights a concerning state of affairs and urges medical professionals—who also serve as social role models and health advocates—to take prompt anti-tobacco and tobacco cessation measures. Concerns regarding tobacco control and cessation programs remain centered around the health of the public and the individual.

The fight against tobacco can gain traction by focusing interventions on future medical professionals. Proactive actions should be implemented to address smoking concerns among medical students. Curriculums for skill-based medical schools should highlight and incorporate effective smoking cessation techniques (Brar et al. 2020)

Boopathirajan & Muthunarayanan (2017) discovered that while less than 5% of the medical students involved were habitual smokers, between one-third and half of them had been exposed to second-hand smoke at home and in public places. This implies that increased public health efforts are needed to prevent and minimize smoking in homes and public spaces. The vast majority of participants concurred that medical students should receive official teaching in smoking cessation techniques as part of their curriculum in order to enable them to counsel or advise patients.

Health promotion interventions (HPI) that combined personal empowerment with social support and advocacy increased employee knowledge and attitudes. Counselling programs, pamphlet distribution, anti-smoking posters, and no-smoking signs were a few of the tactics HPI employed. Staff smoking rates while off-site significantly decreased, and smoking rates within the hospital were completely discontinued as a result of HPI's success in bringing attention to the problem and encouraging a positive attitude towards quitting. Smoking bans ought to be continuously reviewed, observed, and improved upon by all hospitals (Usman et al. 2014).

1.2: Need of the study.

With almost 8 million deaths worldwide each year from the tobacco pandemic, it is one of the greatest risks to public health that the world has ever seen. Approximately 1.2 million of the deaths are attributable to second-hand smoke exposure for nonsmokers, whereas over 7 million are directly related to tobacco usage. The majority of the 1.3 billion tobacco users globally—more than 80%—live in low- and middle-income nations, which bear the brunt of the disease and mortality caused by tobacco use. Because tobacco smoking takes money away from fundamental necessities like food and shelter, it contributes to poverty (Factsheets/Detail/Tobacco/2020).

In 2025, there will still be significant variations in tobacco use throughout nations if current trends persist, which puts many at danger of failing to meet their targets for tobacco control and many low- and middle-income countries at risk of seeing their tobacco epidemics get worse. It will take an urgent, efficient, and continuous effort to attain and sustain acceptable tobacco control trajectories and bring about global convergence toward the cessation of tobacco use (Bilano et al. 2015).

Research was done on the prevalence, attitudes, and awareness of tobacco use among hospital healthcare personnel in Italy. 51.4 percent of the 1082 health professionals who participated in the study were female, with a mean age of 37.3 years. Of them, 25.3% were nurses, 24.5 percent were doctors, 17.1 percent were students, and 33.1% were other healthcare workers. 44 percent of people smoked. 90.5% of respondents said they had witnessed coworkers smoking cigarettes within the hospital (47.4% in the dependents' restrooms, 33.4% in the department kitchens, and 4.7% in the patient room). Of the respondents, 67.7% thought that healthcare professionals should serve as role models for the general public (Ficarra et al. 2011).

Over 20% of the health professionals in the study who were examined for their use of tobacco and their role in helping them quit in Nepal were found to be current users. With an emphasis on men and alcohol users, health practitioners should make efforts to reduce tobacco usage (Pokhrel et al. 2006).

Additionally, research on tobacco use among medical staff members at a tertiary care facility in Faridabad, Haryana, India, came to conclude that 43.4% of people reported using tobacco products overall. Of the employees who used tobacco, over half (53.2%) used smokeless tobacco. Nursing assistants favored smoking in the form of cigarettes (41%). Participants talked about the social and cultural contexts in Haryana that support the practice and maintenance of hookah smoking. The primary justification for continuous usage in daily life was frequently cited as being the need to smoke for social interaction and relaxation. For housekeeping employees, the state of their workspace was a strong motivator for continuing to do their existing jobs (Prasad et al. 2020).

Similar findings were found in research done among Greek nursing students, which found that 33% of participants were current, active smokers and 74% had ever tried smoking. When compared to current smokers, nonsmokers had higher positive opinions of tobacco control policies, including outlawing smoking in bars and cafes (82% vs. 34%, $p < 0.001$), restaurants (94% vs. 61%, $p < 0.001$), and all public spaces (93% vs. 51%, $p < 0.001$) (Patelarou et al. 2011).

According to the guidelines of the Global Health Professions Student Survey, a study was done on the prevalence of tobacco use and related characteristics among medical students. Of the students, 42% had ever smoked cigarettes and 24% were current smokers. Almost half of the participants had tried cigarettes for the first time before turning 20. Smoking was linked to the male gender. There is a strong correlation between abstaining from smoking and supporting the law that prohibits smoking in public areas. The majority of respondents (98.1%) believed that smoking ought to be prohibited in all enclosed public areas. Given that 20.6% of all respondents reported smoking in college buildings in the previous year, there appears to be a discrepancy in their behavior, attitude, and level of understanding. There was a great desire to stop smoking, but only 42% of respondents said they had received support or guidance in doing so. Just 10% of respondents said they had received official training on smoking cessation methods (Brar et al. 2020).

Despite tobacco control policies, India's tobacco consumption is still rising. More prominent and forceful anti-tobacco programs are required, together with heightened public knowledge of the negative effects of tobacco use and active workplace and health professional involvement in encouraging tobacco cessation (Mohan et al. 2018). Compared to the overall population, health personnel smoke more cigarettes (Prasad et al. 2020).

In an investigation of the prevalence of tobacco use among medical students, Singh et al. (2010) found that 25.11% of them smoked, and 13.70% of them chewed tobacco. The research presents a worrisome situation and urges health professionals—who also act as public health advocates and role models for society—

to take prompt anti-tobacco and tobacco cessation initiatives. Programs for tobacco control and cessation remain vital obstacles for both public and personal health.

The results of a study showed a high prevalence of smokers among medical professionals, indicating the inadequacy of the current anti-tobacco strategy. Healthcare professionals should warn the public about the dangers of tobacco smoke because they do not fully understand the extent to which smoking harms both the smoker and others around them. Encouraging healthcare practitioners to participate in training programs will help them become more skilled in smoking cessation counselling techniques and empower them to actively assist their patients (Juranic et al. 2017).

Throughout the world, a great deal of research has been done on tobacco-related topics; however, there hasn't been much research done on healthcare professionals in Mizoram concerning tobacco. Consequently, the investigator realized the necessity of carrying out research in this domain.

The results will show the prevalence of tobacco use among Mizoram's healthcare workers, elucidating the pattern and level of smoking and smokeless tobacco use prevalence.It will assist with understanding how medical personnel view their advocacy role in helping patients quit tobacco use. This knowledge may, to some extent, cause behavioral shifts among medical professionals and inspire them to give up smoking and serve as role models, advocates, and facilitators for their patients in quitting.

The information will introduce capacity-building measures in the form of tobacco cessation approach training and enlighten the authorities about the significance of directing attention to healthcare professionals for the implementation of the tobacco cessation program. The government might be motivated to create laws and policies that restrict tobacco use by healthcare professionals, particularly in the workplace.

It might also be used as a foundation for determining whether tobacco use risks and benefits of quitting should be included in health care professional course curricula.

1.3: Statement of the problem.

Prevalence, habits, and attitude towards tobacco use among healthcare professionals.

1.4: Objective of the study.

1. To identify the prevalence of tobacco use among healthcare professionals.
2. To compare the prevalence of tobacco use among healthcare professionals.
3. To assess the habit of health care professionals on tobacco use.
4. To evaluate the attitude of health care professionals on tobacco use.
5. To inspect a relationship between the prevalence of tobacco use and attitude among health care professionals.
6. To find out the association between the attitude of health care professionals on tobacco use with their selected demographic variables.
7. To detect the association between the prevalence of tobacco use among healthcare professionals with their selected demographic variables.

1.5: Hypothesis.

H_1 There is a significant relationship between the prevalence of tobacco use and attitude among healthcare professionals.

H_2 There is a significant association between tobacco use prevalence among healthcare professionals and their selected demographic variables.

H_3 There is a significant association between attitudes toward tobacco use among healthcare professionals and their selected demographic variables.

1.6: Scope and limitation of the study.

Extensive tobacco use prevalence is a major health concern all over the world. The study aims to identify the prevalence of tobacco use among healthcare professionals, it will describe the habits and assess the personal attitudes toward tobacco consumption. Determination of the association between the prevalence of tobacco among healthcare professionals with their selected demographic characteristics will be carried out. Association between the attitude towards tobacco use among healthcare professionals and their demographic variables will also be identified.

The study is limited to 426 healthcare professionals only, such as medical doctors, dentists, nurses, pharmacists, and multipurpose health workers. Other healthcare professionals who also play an important role in healthcare services were not included. Data collection is done by introducing a self-response questionnaire in a hybrid mode, online and offline. Collection of data by face-to-face interview may bring about a different outcome of the study. Moreover, the same sample size from each stratum/profession might give a better representation of each profession.

1.7: Operational Definition.

Prevalence.

According to Cambridge Dictionary, prevalence is defined as:

“The fact that something is very common or happens often”

In this study prevalence is:

The proportion of individuals in the study population having a habit of using tobacco in any form.

Habit.

According to Cambridge Dictionary, habit is defined as:

“Something that you do often and regularly, sometimes without knowing that you are doing it”

In this study habits is:

The tendency and behavior of a healthcare professional in using any form of tobacco.

Attitude.

According to Cambridge Dictionary, attitude is defined as:

“A feeling or opinion about something or someone, or a way of behaving that is caused by this”

In this study attitude is:

The feeling or emotion either negative or positive of a healthcare professional toward tobacco use.

Tobacco use:

According to Merriam-Webster: -

Tobacco is defined as:

“The leaves of cultivated tobacco prepared for use in smoking or chewing or as snuff”

Use is defined as:

‘To consume or take (liquor, drugs, etc.) regularly”

In this study tobacco use is:

Taking or consuming tobacco in the form of smoking, chewing, eating, or snuffing.

Health Care Professionals:

According to the Cambridge Dictionary: -

“Health Care Professional is someone who works in the medical profession, for example, a doctor or nurse.”

In this study, Health Care Professionals are:

Doctors, nurses, dentists, pharmacists, and multipurpose health workers who are registered to their respective councils/professional organizations and are presently in service at either government, mission, or private health facilities in Mizoram.

1.8: Conceptual Framework.

The structure that links the hypotheses, presumptions, convictions, and concepts behind research is known as a conceptual framework. It sets the parameters for formulating a research question and identifying significant responses. There are several ways to present a conceptual framework: narrative, graphical, or pictorial.

The Knowledge, Attitude, and Practices (KAP) survey approach served as the foundation for the conceptual framework employed in this study. Access to both quantitative and qualitative data is made possible by this quantitative approach, which uses pre-formulated questions formatted in standardised questionnaires. KAP surveys uncover misconceptions or misunderstandings that could be impediments to behaviour change and to the actions we would like to carry out.

KAP surveys are based on "declaratives," or statements, and effectively record a "opinion." To put it another way, the KAP survey shows what was stated, but there could be significant discrepancies between what is said and reality. KAP surveys were first used for population research and family planning in the 1950s Andrade et al. (2020).

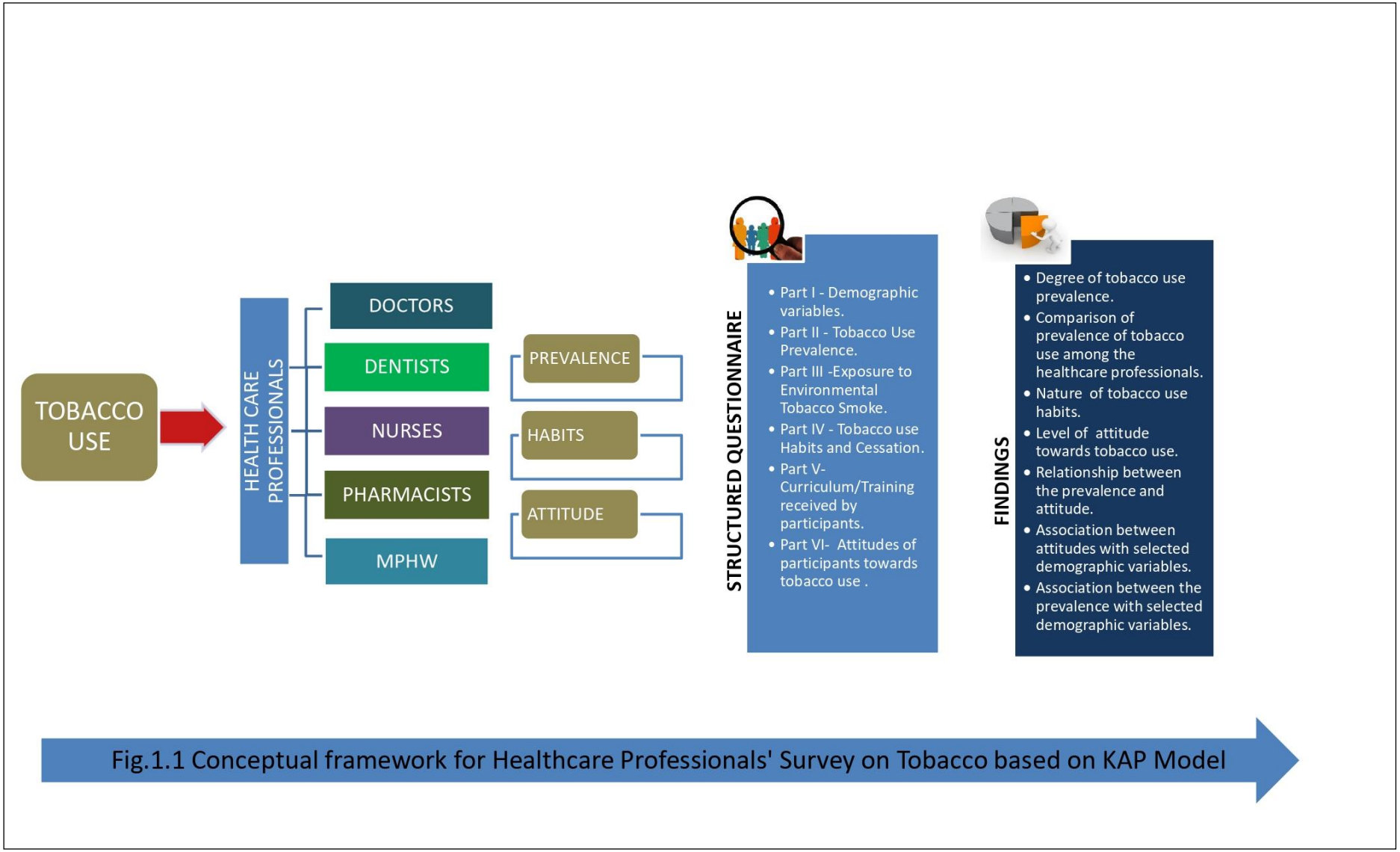

Fig.1.1 Conceptual framework for Healthcare Professionals' Survey on Tobacco based on KAP Model

CHAPTER -II
REVIEW OF LITERATURE

This chapter deals with the review of related literature. A literature review is a thorough summary of earlier studies on a subject. The review should list, characterize, condense, impartially assess, and elucidate this earlier work. It ought to provide the research with a theoretical foundation and assist you, the author, in defining the scope of your investigation. A literature review examines published studies in a certain field and occasionally research conducted in a specific field within a specific time frame. Though it might be as basic as summarising the sources, a literature review often follows an organizational structure and incorporates both synthesis and summary.

A written synopsis of significant works and additional materials on a chosen subject is called a literature review. Academic journals, books, official documents, websites, and other materials may be included in the review. For every source, the literature review offers an analysis, synopsis, and rating.

The purpose of a literature review is to:

- Give a basic understanding of the subject.
- Determine areas of previous research to avoid repetition and to acknowledge the contributions of other scientists.
- Find discrepancies in the literature, such as research gaps, disagreements between studies, and unanswered issues from other studies.
- Determine the need for more research and provide evidence for it.
- Determine how different works relate to one another and to the topic at hand.
- Make a case for the necessity for more research by placing one's findings within the framework of previously published works.

2.1: Tobacco use prevalence:

2.1.1: Global Tobacco use prevalence.

WHO (2021) Global Report on Trends in the Prevalence of Tobacco Use 2000-2025 declared that No degree of tobacco exposure is safe and that using tobacco in any form is detrimental. The most prevalent type of tobacco usage in the world is smoking cigarettes. Additional tobacco products include bidis and kreteks,

heated tobacco, waterpipe tobacco, cigars, cigarillos, and smokeless tobacco products. The burden of tobacco-related sickness and death is greatest in low- and middle-income countries, home to almost 80% of the 1.3 billion tobacco users globally. Because money spent on tobacco replaces other essentials like food and shelter, tobacco use is one factor supporting poverty. Given how addicting tobacco is, it is challenging to stop this spending habit. The financial toll that tobacco use takes is high and includes high medical expenses for curing the diseases that tobacco use causes as well as lost human capital due to morbidity and death linked to tobacco use.

Reitsma et al. (2021) in their study Spatial, temporal, and demographic patterns in prevalence of smoking tobacco use and attributable disease burden in 204 countries and territories, 1990–2019: a systematic analysis from the Global Burden of Disease Study 2019 reported the following: - Globally, 1·14 billion people (95% confidence interval 1·13–1·16) were smokers as of 2019, and they used 7·41 trillion (7·11–7·74) tobacco cigarette equivalents at that time. The prevalence of smoking has significantly decreased among males (27·5% [26·5–28·5] reduction) and females (37·7% [35·4–39·9] reduction) aged 15 and older since 1990; however, due to population growth, the total number of smokers has significantly increased from 0·99 billion (0·98–1·00) in 1990. Smoking was the greatest cause of mortality among men (20·2% [19·3–21·1] of all male fatalities) and was responsible for 7·69 million (7·16–8·20) deaths and 200 million (185–214) disability-adjusted life-years worldwide in 2019.

Dai et al. (2022) in their study Evolution of the global smoking epidemic over the past half-century: strengthening the evidence base for Policy Action, observed that the prevalence of adult smoking worldwide in 2020 was 6.5% (6.3% to 6.7%) for women and 32.6% (32.2% to 33.1%) for males. 1.18 (0.94 to 1.47) billion individuals consume tobacco regularly, which will result in 7.0 (2.0 to 11.2) million fatalities by 2020. In men, the prevalence of smoking has decreased by 27.2% (from 26.0% to 28.3%) and in women, by 37.9% (from 35.3% to 40.1%) since 1990. The highest declines have occurred in higher sociodemographic countries, with frequency

falling by more than 40% in several high-income countries and nearly 70% in several Latin American countries, most notably Brazil, since 1990.

The Tobacco Atlas. (2023) stated that while the prevalence of smoking fell globally from 22.7% in 2007 to 17% in 2021, there was either no change in many countries or an increase in prevalence. Due to a far faster increase in the number of smokers, total consumption has climbed significantly in certain locations despite a decrease in per capita consumption. Rapid economic growth and vigorous industrial promotion in certain nations raise the likelihood of future large rises in smoking.

2.1.2: Prevalence of Tobacco use and attitudes among healthcare professionals.

Mahfouz et al. (2013) conducted a study in Southwest Saudi Arabia to identify Health Care Workers' Tobacco Use. With 736 HCWs in the participants, 26.3% reported using tobacco products overall (14.8% as current users and 11.5% as past users). Males were found to be considerably more likely than females to smoke in a binary logistic regression analysis (aOR = 3.081, 95% CI: 2.004–4.739). Likewise, a substantial risk factor was determined to be the history of tobacco use by parents (aOR = 1.540, 95% CI: 1.040–2.278).89.9% of current users expressed interest in stopping, and 66.1% had already attempted. A possible obstacle to including HCWs as a first line of tobacco control is the high rate of smoking among them in the current study, in addition to being a public health issue.

Mony et al. (2015) conducted a study to assess Tobacco use, attitudes, and cessation practices among healthcare workers of a city health department in Southern India. Their findings concluded that compared to community link workers -LW (2%) and nurses (<1%), doctors reported greater rates of tobacco use (6.9%). However, they showed less enthusiasm for more tobacco control training (77%) than the other groups (>95%). Doctors asked (100%) and advised (78%) about tobacco use, but significantly fewer were assessing the desire or motivation to stop (24%), offering support (19%), and setting up follow-up appointments for quitting and preventing relapses (9%).

Zinonos et al. (2016) also conducted a cross-sectional study to determine the prevalence of smoking and related risk factors among healthcare staff at Nicosia

General Hospital in Cyprus. The study concluded that the incidence of smoking among healthcare professionals was 28.2% overall (28.6% among doctors and 28.1% among nurses). A higher risk of now smoking was found by multivariate analysis to be connected with being male, under 34, single, and having a family history of smoking. While an astounding 72% of smokers today stated they wanted to stop, only 5.6% of doctors and 6.9% of nurses said they had ever used smoking cessation medication. Compared to previous (84.6%) and current (72.7%) smokers, never-smokers advised their patients to stop smoking more frequently (96.4%) ($p < 0.001$). Furthermore, those who reported counseling their patients to stop smoking more frequently than those who did not (92 % vs. 60 %, $p < 0.001$) were the ones who felt more confident in their expertise in quitting smoking.

Prasad et al. (2020) conducted a study focusing on tobacco use among healthcare professionals in Faridabad, Haryana, India's tertiary care center which revealed a high rate of tobacco use. In all, 43.4% of people reported using tobacco products. Five and a half percent of cleaning staff were tobacco users and used smokeless tobacco. Fourteen percent of nursing orderlies preferred to smoke cigarettes. The social and cultural context of hookah smoking in Haryana was deliberated by the participants. Throughout history, the primary justifications for the ongoing daily use of tobacco products have been identified as socializing and relaxing.

Prasad & Kumar (2020) conducted a study to identify tobacco use patterns and related sociodemographic characteristics among healthcare workers in a tertiary care environment in Faridabad. The study revealed that 42.8% (n=306) of the sample had smoked, with housekeeping having a higher prevalence (30.7%) than nursing orderlies (12.7%). Housekeeping employees were more likely to use smokeless tobacco. Among the current tobacco users (n=133), kairi (45%) was the most common consumption type, followed by hookah (21%) and cigarettes (19.5%). In the context of hospitals, tobacco use has been linked to male gender, educational attainment, and the type of work (designation).

Asut (2020) conducted Research to ascertain the level of tobacco usage and certain attitudes among medical faculty members at a university in Northern Cyprus. Of the 146 academics, 128 responded to this cross-sectional study (response rate: 87.7%). The percentage of lifetime smokers was 46.9%. Present smokers made up 21.9% of the population, while non-cigarette product users made up 7.0% and tobacco users overall made up 26.6%. 52.9% of those who smoked did so while attending medical school. Positive sentiments were stated about doctors being nonsmoking role models much more by nonsmokers than by smokers. While 86.5% of respondents supported comprehensive tobacco control in the curriculum, only 33.8% of educational programs included tobacco control. The medical faculty members smoked tobacco quite frequently, and the educational programs did not cover the topic of tobacco use in enough detail. It's encouraging to see that most medical faculty members supported comprehensive tobacco control education.

2.1.3. Prevalence of Tobacco Use in Mizoram.

Phukan et al. (2005) conducted a hospital-based case-control research study to determine the impact of tobacco smoking on the risk of stomach cancer in Mizoram. The study found that there was a statistically significant increase in the risk of stomach cancer among current smokers (odds ratio (OR), 2.3; 95% confidence interval (95% CI), 1.4-8.4), but not among ex-smokers. Those who smoked meizial (a type of native cigarette) had higher risks (OR, 2.2; 95% CI, 1.3-9.3). Individuals who had smoked for more than thirty years were clearly at a higher risk. The participants who smoked for more than 11 pack-years had a 2-fold increase in risk, indicating a considerable increase in risk. The danger rose as the total amount of tobacco smoke (in milligrams) increased. In both univariate and multivariate models, tuibur (tobacco smoke-infused water), which is mostly utilized in Mizoram, appeared to raise the risk of stomach cancer among current users (OR, 2.1; 95% CI, 1.3-3.1). The risk was considerable for tobacco chewers alone (OR, 2.6; 95% CI, 1.1-4.2). After controlling for confounding factors, the use of tobacco in any form—smoking, smokeless (tuibur and chewing)—increased the incidence of stomach cancer in Mizoram on its own.

Global Adult Tobacco Survey GATS 2 India 2016-17 report states that:

- A total of 58.7% of adults, 52.4% of women, and 64.9% of men smoke tobacco or use smokeless tobacco.
- Among all adults, 34.4% smoke tobacco, 14.3% of women, and 54.1% of men smoke.
- Of all adults, 33.5% are smokeless tobacco users, 46.0% of women, and 21.3% of men use it.
- There has been a notable drop in the prevalence of smoking by 5.3 percentage points and smokeless tobacco usage by 7.2 percentage points between GATS 1 and 2. Between GATS 1 and GATS 2, the prevalence of tobacco use fell significantly, from 67.2% to 58.7%.
- The most often used tobacco products in the state are cigarettes and tobacco for oral application; among adults, 29.1% smoke cigarettes and 21.6% use tobacco for oral application.
- Between the ages of 15 and 17, the incidence of tobacco use fell from 35.4% in GATS-1 to 27.0% in GATS 2.
- Between GATS 1 and GATS 2, the average age of tobacco use initiation rose from 17.4 to 17.8 years.
- Healthcare professionals recommended quitting smoking to 51.8% of smokers and suggested quitting using smokeless tobacco to 37.5% of users.
- Second-hand smoke exposure was reported by 44.4% of people who worked indoors.
- Second-hand smoke exposure occurred in any public setting for 18.2% of all adults.
- Because of the warning label, 17.2% of smokers considered giving up. 26.0% of people who use smokeless tobacco have considered giving it up due to warning labels.

Priyanka et al. (2019) did a study to find out the prevalence of tobacco product use among the population of Aizawl. Eighty percent of the sample used tobacco in one way or another. Males were more likely to smoke (64.5%), while

females chewed tobacco more frequently (77.5%). Chewing tobacco was most common among housewives (48.3%). 32.3% of students reported smoking. In conclusion, they stated that a high percentage of tobacco usage is not the result of ignorance or illiteracy but rather of societal norms, habits, and acceptance of the practice. The tobacco control system must be rigorously enforced by the state government. Tobacco products must be legally prohibited from being sold or consumed in public.

Saikia et al. (2021) examined modifying trends in tobacco use and cessation behavior in Northeast India. Their findings show that adult SLT use increased by 3.9% on average between 2009–10 and 2016–17. During that same time frame, there was a 2.4% decrease in the prevalence of smoking. Adult smoking rates were found to be declining, but SLT usage was more common among women, illiterate persons, and households in rural and impoverished areas. A significant proportion of educated people, students, and homemakers, reported that they had quit smoking; however, the proportion of attempts to quit SLT had increased significantly among older adults, rural residents, and those with low education levels. The study draws a Conclusion that to help individuals in the northeastern regions of India stop using SLT and smoking, community-based initiatives including women, youth, and the less educated and impoverished adults are required.

Government of Mizoram DP&PR (2022) stated that according to a combined ICMR-NCDIR survey, up to 77.1% of Mizoram residents use tobacco products, both smoked and smokeless. The percentage of people who use smokeless tobacco is higher than that of smoked tobacco, at 54.1%, compared to 43.6 percent for smoked tobacco. The poll indicates that among former smokers, the average age at which they started using tobacco products was 20.2 years, and the average length of time they used them was 20.9 years. Merely 7.1% have received advice from medical professionals or other health workers to stop using tobacco products. Exposure to second-hand tobacco smoke was reported by 86.8% of the respondents. The majority (58.1%) currently utilize non-tobacco betel items such as Areca nuts, pan masala, or betel quid. According to the report, up to 54.6% of people use betel quid regularly.

2.2: Hazards of Tobacco Use.

2.2.1: Hazards of Smoking.

Aboaziza & Eissenberg (2015) published a paper titled Waterpipe Tobacco Smoking: what is the evidence that it supports nicotine/tobacco dependence? Where it was stated that Waterpipe Tobacco Smoking (WTS) promotes nicotine/tobacco dependence because it is linked to the delivery of nicotine and because some smokers go through withdrawal when they stop using a water-pipe, change their behaviour to get a water-pipe, and find it difficult to stop even when they are motivated to. The public has to be made aware of the risks associated with WTS, which include dependency, disability, sickness, and mortality. Additionally, WTS needs to be included in the same public health programs that address tobacco cigarettes. Research into the assessment of WTS-induced tobacco dependence is desperately needed.

Andrade et al. (2020) carried out a systematic review and meta-analysis on the relationship between active tobacco smoking during pregnancy and the health of the foetus. Twenty-one pertinent articles encompassing 24 investigations were analysed by them. Infants born to mothers who used tobacco actively during their pregnancies experienced more wheeze episodes, according to the pooled OR (OR 1.50, 95% CI 1.27 to 1.77, $p<0.01$). Regarding lung function parameters, there were contradictory findings. A meta-analysis comprising two studies with similar methodology revealed a tendency towards a lower maximum flow rate at the functional residual capacity of -34.59 mL/s (95% CI -72.81 to 3.63, $p=0.08$) in infants younger than one month who were born to pregnant women who smoked. For babies born to moms who used smokeless tobacco during their pregnancies, there was a reported increased risk of apnoea; however, there was inconclusive evidence for babies born to mothers who actively smoked tobacco during their pregnancies. It was determined that babies whose moms were heavy smokers during their pregnancies had a greater chance of developing wheezing and might have weaker lungs. An increased risk of infantile apnoea has been linked to pregnant women who use smokeless tobacco.

The American Cancer Society (2020) reported that Smokers generally pass away ten years before those who have never smoked. Most people are aware that smoking can lead to cancer. But in addition to harming almost every organ in the body—including the heart, lungs, blood vessels, reproductive organs, mouth, skin, eyes, and bones—it can also result in a variety of other illnesses Smoking is to blame for almost 80% of lung cancer cases and all lung cancer-related fatalities. For both men and women, lung cancer is the primary cause of cancer-related deaths. Additionally, smoking raises the risk of developing malignancies in the mouth, throat, pharynx, oesophagus, kidney, cervix, liver, and bladder.

Zhuge et al. (2020) conducted a study that aimed to investigate the impact of parental smoking and indoor tobacco smoke exposure on children's respiratory outcomes. Preschoolers ages one to eight years old participated in the study, which was carried out in more than 200 kindergartens across eight major Chinese cities between January 2010 and December 2012. They concluded that among children aged 3-8, the lifetime-ever incidence rates of croup, dry night cough, frequent common cold, and pneumonia are 6.0%, 9.5%, 17.1%, and 32.3%, respectively. In the cities under investigation, the rate of smoking by mothers was minuscule at less than 1%, whereas the rate of smoking by fathers was over 45%. 25.3% of children were exposed to indoor tobacco odour during infancy (3.7% frequently and 21.6% occasionally), while 35.3% were exposed during childhood (6.3% regularly and 29.0% occasionally). The sense of indoor tobacco smoke odour and parental smoking were weakly correlated. The smell of indoor tobacco smoke was more significantly connected with respiratory outcomes than parental smoking. It was discovered that exposure in infancy and childhood (based on indoor smoke odour) were separate risk factors for respiratory outcomes, with infancy exposure having a larger impact. This study adds to the body of evidence showing children's respiratory health is at danger from indoor smoke exposure.

Kalan et al. (2021) collected data for a study on COVID-19 and attitudes toward tobacco smoking from April 1 to May 31, 2020, by sending an online survey to Iranian citizens via Telegram. A total of 946 people replied to this study. The study's main conclusions are that in comparison to never-smokers 1) Smokers who

use cigarettes were less likely to think that smoking cigarettes can spread COVID-19; 2) Smokers who use water-pipes at home are more likely to think that smoking waterpipes protects against COVID-19 and that smoking waterpipes may speed up recovery from COVID-19; 3) Both waterpipe and cigarette users thought that using e-cigarettes in public was a safe practice during the COVID-19 pandemic; and 4) more than half of the ex-smokers quit smoking as a result of COVID-19. Our results highlight the necessity of promoting cessation programs and educating people about the unsubstantiated claims of a lower risk of tobacco product use or potential protective effects against COVID-19.

Piper et al. (2022) analysed the Utilization of tobacco and nicotine (Primer). In the United States and Canada, every million cigarettes smoked result in one death; in the United Kingdom, however, the death toll is significantly higher. According to 21st-century dangers, smokers who begin smoking before the age of thirty and do not give it up lose ten years of their life expectancy in comparison to non-smokers. Cessation results in significant decreases in the risk of death, especially before the age of 40. At non-smoking death rates, up to two-thirds of smokers' deaths are preventable, and former smokers have only about a fourth of the additional risk of death compared to current smokers. Remarkably little is known about the dangers of smoking in the general public compared to scientific knowledge.

WHO (2023) has stated that the health effects of tobacco smoke are enormous. You can't smoke safely. There is no way to mitigate the health risks associated with smoking cigarettes by switching to a cigar, pipe, e-cigarette, or hookah. The American Lung Association estimates that there are roughly 600 chemicals in a single cigarette. A lot of these components are also found in hookahs and cigars. More than 7,000 compounds are produced as they burn, many of which are poisonous. Of them, at least 69 are known to be carcinogenic or to cause cancer.

2.2.2: Hazards of Second-hand Smoke

Wahabi et al. (2013) conducted a study to identify Second-hand smoke's effects on term babies' birth weights and the demographics of Saudi women exposed to it. Thirteen percent of mothers in the group had been exposed to SHS. Compared

to newborns of unexposed mothers, the mean birth weight of exposed moms was considerably lower at 35 g, 95% CI: 2–68 g, and the mean length was shorter at 0.261 cm, 95% CI: 0.058-0.464 cm, P = 0.012. In addition to being less likely to be primiparous, women exposed to SHS were also younger, of poorer parity, and more likely to be illiterate than those who were not. The study concluded that Pregnant Saudi women are more likely (31%) to have been exposed to SHS, which is linked to lower birth weight and shorter baby length.

Naeem (2015) in her article about Second-hand smoke–ignored implications wrote that when someone is smoking close by, nonsmokers are regularly exposed to smoke, which poses a health risk to them. second-hand smoke can affect non-smokers in a variety of public settings, including eateries, workplaces, retail establishments, autos, parks, schools, and childcare facilities. Children are regularly exposed to the chemicals in second-hand smoke, especially if their parents or older siblings smoke at home. Despite being inhaled in a more diluted form, second-hand smoke is just as harmful as mainstream smoke. It has ammonia, nitrosamines, and carbon monoxide in it. Any type of tobacco use, including smoking cigarettes, cigars, pipes, water pipes (shisha), etc., can produce second-hand smoke. At least 250 of the more than 4,000 chemical components found in tobacco smoke are known to be harmful to health.

Carreras et al. (2021) in their study on Disease burden among adult citizens of European Union nations resulting from exposure to second-hand tobacco smoking at home, concluded that EU countries continue to bear a heavy weight from SHS exposure. In the 28 EU countries in 2017, household SHS exposure was linked to 526,000 DALYs (0.36% of total DALYs) and 24,000 deaths (0.46% of total deaths), primarily from COPD and IHD. The burden was largest in South-Eastern EU nations, where the proportion of DALYs/deaths related to SHS exposure was more than 0.50%/0.70%, while the burden was lowest in Northern EU countries, where the proportions of DALYs/deaths were lower than 0.25%/0.34%.

Tripathy (2020) observed the results of the Global Adult Tobacco Survey 2016–17 on second-hand smoke exposure among smokers and non-smokers in India.

The observation revealed that in India, a significant number of adults—smokers and non-smokers alike—are exposed to second-hand smoke (SHS) at home, at work, and in other public settings, including restaurants, public transit, and businesses. Men are more likely to be exposed to SHS in public settings, such as the workplace than women are at home. Concerningly it was also identified that SHS exposure is relatively high among the youth. To guarantee 100% smoke-free households, public areas, and workplaces and lower SHS exposure, stricter enforcement of the law is necessary.

Korsbæk et al. (2021) conducted a study on Second-hand smoke exposure associated with risk of respiratory symptoms, asthma, and COPD in 20,421 adults from the general population. The participants were those who were exposed to second-hand smoke at various life stages in the Danish General Suburban Papulation. The study concluded that Lifelong second-hand smoke exposure increases the incidence of respiratory symptoms, asthma, and COPD. In the general population, these individuals may make up 4.3% and 2.9% of those with asthma and COPD, respectively.

CDC (2024) reported that there is no safe level of exposure to second-hand smoke, people who do not smoke but who are exposed to second-hand smoke, even for a short time, can suffer harmful health effects. As per the report, exposure to second-hand smoke, even for brief periods, can have detrimental consequences on the health of nonsmokers. Lung cancer, heart disease, stroke, and other conditions can be brought on by second-hand smoke exposure in persons who do not smoke. Premature death may potentially be the outcome. Children and infants exposed to second-hand smoke are susceptible to respiratory infections, ear infections, asthma episodes, and sudden infant death syndrome (SIDS).

Flor et al. (2024) conducted a thorough analysis of the research on the negative effects of SHS exposure on nine health outcomes that were published by July 2022. They studied the Burden of Proof Risk Function methodology to quantify each exposure-response link while taking into account different sources of uncertainty and assess the quality of the evidence pertaining to the findings. They

discovered that exposure to SHS was linked to all nine health outcomes. They calculated that, on a cautious basis, SHS raises the risk of lung cancer, type 2 diabetes, ischemic heart disease, and stroke by at least 8%, 5%, 1%, and 1%, respectively. The evidence for these detrimental connections is evaluated as inadequate (two stars). The evidence was poorer (one star) in favour of the detrimental links between SHS and lower respiratory infections, asthma, otitis media, breast cancer, and chronic obstructive pulmonary disease. Their findings highlight the detrimental impacts of second-hand smoke on health, even in the face of scant supporting data. Therefore, it is imperative that efforts to decrease both active and passive smoking be prioritized by combining public health regulations with educational programs.

2.2.3: Hazards of Smokeless Tobacco

Gupta et al. (2020) organized a comprehensive evaluation and meta-analysis of worldwide data which revealed a link between smokeless tobacco use and cerebrovascular accidents. When compared to non-users, the total risk of stroke was shown to be considerably greater among SLT users (1.17, 95% CI 1.04–1.30), particularly for users in Southeast Asia. Even after a stringent correction for smoking, the results didn't alter (1.18, 95% CI 1.04–1.32). SLT users did not increase their risk of nonfatal stroke, but their risk of fatal stroke increased by 1.34 times or 13.4%. Compared to non-chewers, chewers had a significantly increased risk of stroke (1.35, 95% CI 1.20–1.50). Research based on gender revealed that both male and female users had an increased chance of dying from a stroke. At 14.8%, India had the highest SLT-attributable fraction of fatal strokes.

Khan et al. (2020) studied Oral cavity cancer risk with the use of smokeless tobacco. Patients receiving treatment for cancer of the oral cavity were classified as cases, and the companions of different cancer patients who visited the hospital during that time were identified as the control group for the study. Findings: Among cases and controls, the crude OR for "ever smokeless tobacco users" was 4.98 (95%CI; 2.76-9.01). After accounting for age and smoking, the OR for betel leaf users was 4.42 (95%CI; 1.66-11.91) and for snuff users was 4.82 (95%CI; 2.37-9.80) across

cases and controls. In summary, the research offers compelling proof that betel leaf and snuff serve as separate risk factors for oral cavity cancer.

Siddiqi et al. (2020) examine the latest studies of data from 127 nations showing the global burden of disease resulting from adult use of smokeless tobacco. The examination throws light that adult ST use was documented in 127 countries, with South and Southeast Asia having the greatest rates of usage. This area likewise has the greatest estimated cancer risk. The world lost 90,791 lives and at least 2.5 million DALYs in 2017 as a result of ST-related oral, pharyngeal, and oesophageal malignancies. According to risk estimations from the INTERHEART study, ST-related ischemic heart disease resulted in almost 6 million DALYs and 258,006 fatalities. Men accounted for three-quarters of the ST-related illness burden. Geographically, South and Southeast Asia accounted for more than 85% of the ST-related burden, with Bangladesh contributing 5%, Pakistan 7%, and India 70% of the DALYs lost.

Saxena et al. (2023) conducted a worldwide comprehensive analysis of the relationship between public health nutrition and the use of smokeless tobacco. The analysis revealed that SLT use has a huge impact on body weight, alteration in taste, poor oral health, and consumption of fruits and vegetables leading to malnutrition. Maternal use of SLT not only leads to anaemia but also hampers birth outcomes. Increased risk of metabolic syndrome and gallstone disease among SLT users are also well documented in the studies. Therefore, the researchers concluded by stating that the review emphasizes the connections between the use of SLT and subpar nutritional results. To obtain overall health advantages, public health nutrition and tobacco control activities should combine. Along with expenditures in public health nutrition intervention, attention needs to be paid to investigating appropriate strategies for SLT cessation in conjunction with improving food and nutrition security at the community level.

2.3: Tobacco Cessation and Health Care Professionals.

Sarna et al. (2015) researched Tobacco Cessation Practices and Attitudes Among Nurses in the Czech Republic. The research participants were 157 nurses in the Czech Republic. The study aims to determine the frequency of nurses' interventions to assist smokers in quitting, assess their attitudes and abilities, and investigate the connection between nurses' smoking status and level of intervention. They identified that few nurses in the Czech Republic regularly assist patients in quitting smoking, possess the necessary skills, or see this as a crucial aspect of their job. Twenty-six percent "always" or "usually" helped patients give up smoking. Just 22% of respondents thought nurses could be very helpful in helping patients stop smoking, while 65% said they could only help smokers quit "fairly/poorly." Thirty percent of nurses smoked, and they were less likely to schedule follow-up support or regularly monitor their smoking status.

Grech et al. (2020) organized a study on Brief tobacco cessation interventions: Practices, opinions, and attitudes of healthcare professionals. Among the healthcare professionals (n = 133) who attended one of ten training sessions on brief interventions for smoking cessation, which were held monthly in Malta between September 2018 and June 2019, the study sought to determine the extent to which these professionals practiced quitting smoking and their opinions and attitudes regarding this matter. Female nurses who had never smoked made up the majority of participants. According to reports, the majority of professionals assessed (70.5%), counselled (83.5%), and asked (76.3%) patients to stop using tobacco products; however, fewer offered help (40.9%) and set up follow-up (24.2%). Physicians were found to have counselled patients more frequently than other participants during the preceding week. The majority of experts agreed that patients should be counselled to quit, but many said they didn't have enough time. Compared to people who had never smoked, former smokers were more likely to disagree, even if the majority thought it was difficult to help clients quit (OR=6.86; 95% CI: 2.17–21.71; p=0.001). In summary, more efforts to educate medical staff on smoking cessation strategies are advised, however, healthcare management must investigate and take appropriate

action due to an organizational barrier—a lack of time. Involving former smokers in training activities would be beneficial since they were more confident in their ability to assist patients in quitting.

Due to a lack of understanding of tobacco cessation counselling, dental students were unconfident when offering counselling to tobacco users. The majority of participants, nevertheless, were also inspired to pursue additional counselling training. To raise awareness of the issue and support dental professionals in providing successful tobacco cessation counselling, the study emphasizes the significance of including a program on tobacco cessation counselling in the dentistry students' curricula.

El Hajj et al. (2021) conducted a study on- A pharmacist-delivered smoking cessation program in Qatar: an exploration of pharmacists' and patients' perspectives of the program. They introduced an intense program for quitting smoking, conducted by pharmacists, in eight primary care pharmacies in Qatar. Interviews were conducted with 22 patients and 8 chemists. The results of the interviews revealed seven themes. 1) Based on their positive experiences, they believed that pharmacists were among the best medical professionals to offer smoking cessation strategies. (2) The initiative offered beneficial services. (3) Difficulties included job obstacles, communication and cultural difficulties, trouble motivating and following up with patients, (4) Lack of motivation to quit or stick to the plan, severe nicotine dependence, stress, and personal issues are obstacles to quitting. (5) Patient-related inducers to stop smoking include the emergence of smoking-related problems, spiritual convictions, and assistance from outside. (6) Patients regarded the use of drugs to help them stop smoking as a program-related facilitator, while chemists saw behavioural treatment as a facilitator. (7) Suggested methods for program enhancement included improving patient recruitment and pharmacist training. The program was thought to help patients stop smoking, and it significantly advanced the function of pharmacists, according to the investigators' conclusion. Successful pharmacist smoking cessation programs in Qatar can be developed in the future with the help of the study's conclusions.

Vashi et al. (2021) conducted a cross-sectional study on the Knowledge and attitude of dental students of Navi Mumbai on tobacco cessation counselling: using a survey questionnaire where responses from 691 interns and fourth-year BDS students in Navi Mumbai were received and analysed. A little over 75.3 percent of the participants said they lacked the necessary training to offer counselling to help people quit smoking. Nonetheless, 84.2% of respondents said they would be happy to advise their patients in this area. Approximately 62.1% of dentistry students believed that patients do not pay attention to their advice to quit, and 89.6% of students thought that it is their responsibility to counsel patients on quitting smoking.

2.4. Tobacco-related laws and regulations.

2.4.1: Tobacco Control Laws (2023).

Summary: India became a Party to the WHO Framework Convention on Tobacco Control on February 27, 2005.

Smoke Free Places: Smoking is completely banned in many public places and workplaces such as healthcare, educational, and government facilities and on public transport. The law, however, permits the establishment of smoking areas or spaces in airports, hotels having 30 or more rooms, and restaurants having seating capacity for 30 or more. Concerning outdoor places, open auditoriums, stadiums, railway stations, and bus stops/stands are smoke-free. Sub-national jurisdictions may enact smoke-free laws that are more stringent than the national law.

Tobacco Advertising Promotion and Sponsorship: Advertising through most forms of mass media, including online curated content, is prohibited. There are some restrictions on tobacco sponsorship and the publicity of such sponsorship.

Tobacco Packaging and Labelling: Health warning labels are pictorial and text; cover 85 percent of the front and back panels of the tobacco product package parallel to the top edge; and are rotated every 12 months. Misleading packaging and labelling, including terms such as “light,” and “low-tar” and other signs, is prohibited.

Cigarette Contents and Disclosures: The law does not grant the authority to regulate the contents of cigarettes. The law does not require that manufacturers and importers disclose to government authorities' information on the contents and emissions of their products.

Sales Restrictions: The law prohibits the sale of tobacco products via vending machines and within 100 yards of any educational institution. In addition, several states ban the sale of single cigarettes and gutka and other forms of smokeless tobacco. There are no restrictions on internet sales or the sale of small packets of cigarettes or other tobacco products. The sale of tobacco products is prohibited to persons under the age of 18.

E-Cigarettes: The law prohibits the production, manufacture, import, export, transport, sale, distribution, and advertising of e-cigarettes. There are no restrictions on the use of e-cigarettes.

Heated Tobacco Products: The sale of heated tobacco products (HTPs) is prohibited. Existing smoking restrictions apply to HTPs. The law bans the direct and indirect advertisement and promotion of both tobacco inserts and devices.

Roadmap to Tobacco Control Legislation: The Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply, and Distribution) Act, 2003 (COTPA) is the principal comprehensive law governing tobacco control in India. The Act was passed before India became a Party to the WHO Framework Convention on Tobacco Control. In 2004, the Ministry of Health and Family Welfare exercised the powers granted to it in Section 31 of COTPA by promulgating a first set of rules, which, with respect to smoke free and tobacco advertising issues, have been stayed by court orders or superseded. With respect to general enforcement of COTPA, G.S.R. 1866(E) lists certain officers who are authorized to carry out the entry, search, and seizure provisions of the Act.

Following the passage of COTPA in 2003, various rules implementing COTPA address smoke-free policies or provide useful definitions. These include

G.S.R. 561(E) (defining the term "educational institutions"); G.S.R. 417(E) (superseding the 2004 Rules and establishing new rules covering designated smoking areas, and enforcement obligations, authorities and penalties, among other items); G.S.R. 680(E) (authorizing certain persons to collect fines for violations of smoke-free rules); and G.S.R. 500(E) (amending the 2008 rules established by G.S.R. 417(E)). The Railways Act, of 1989 also regulates smoking on trains.

With regard to tobacco advertising, promotion, and sponsorship, G.S.R. 345(E) amends the 2004 Rules by substituting new provisions on point-of-sale advertising and adding a definition of indirect advertising. G.S.R. 619(E) provides additional point of sale rules, and G.S.R. 786(E) establishes rules for television and film and print and outdoor media. G.S.R. 708(E) updates the rules for television and film, and G.S.R. 400(E) adds health warning requirements for online curated content. Additionally, the Cable Television Networks (Regulation) Act, 1995 (CTNA) and its 2009 implementing rules prohibit direct advertising of tobacco products on Indian cable networks, but permit the indirect advertising of such products under certain circumstances. A subsequent Ministry of Information and Broadcasting Directive, however, appears to prohibit indirect advertising of tobacco products until guidelines called for by the CTNA Rules are issued. Finally, Guidelines issued pursuant to Section 5B (2) of the Cinematograph Act of 1952, require the Central Board of Film Certification to ensure that certain types of smoking scenes do not appear in movies.

Packaging and labelling provisions are included in several implementing rules enacted following COTPA's passage in 2003. G.S.R. 182(E) (Packaging and Labelling Rules of 2008) contains certain definitions and establishes the components (i.e., content, size, rotation, etc.) of the health warnings, but various provisions in subsequent rules replace certain language in the 2008 regulations. For example, G.S.R. 693(E) requires that health warnings be printed, pasted or affixed on external packaging such as cartons. G.S.R. 305(E) updates the definition of "package" and the location of the health warnings, deleting the requirement that the warnings be located on both sides of tobacco product packaging. G.S.R. 985(E) changes the rotation period of the health warnings from one year to two years and re-establishes the warnings published in G.S.R. 182(E). (G.S.R. 985(E) caused the diseased lungs and

scorpion health warnings to continue in effect instead of new health warnings which were supposed to come into force in December 2010.) The government implemented new rounds of warnings on December 1, 2011 (via G.S.R. 417(E)) and on April 1, 2013 (via G.S.R. 724(E)).

On October 15, 2014, the government introduced new larger warnings via G.S.R. 727(E) that, among other things, increased the warning size from 40 percent of one side of tobacco product packaging to 85 percent of both sides of tobacco packaging and amended the rotation scheme prescribed in G.S.R. 985(E). Although the rules announced by G.S.R. 727(E) were to have gone into effect on April 1, 2015, G.S.R. 739(E) establishes April 1, 2016 as the implementation date of the 85-percent health warnings. The government implemented new rounds of warnings on September 1, 2018 (G.S.R. 331(E)), December 1, 2020 (G.S.R. 458(E)), and December 1, 2022 (G.S.R. 592(E)). Provisions prohibiting misleading descriptors and obscuring the health warnings on the package remain in G.S.R. 182(E) unaltered.

The Prohibition of Electronic Cigarettes (Production, Manufacture, Import, Export, Transport, Sale, Distribution, Storage and Advertisement) Act, 2019 (No. 42 of 2019) replaces the 2019 E-Cigarette Ordinance and bans the sale and advertising of e-cigarettes, e-cigarette components, and HTPs.

2.4.2: National Tobacco Control Program (NTCP).

National Tobacco Control Programme (NTCP) (2023) The 11th Five-Year Plan saw the launch of the National Tobacco Control Programme (NTCP) by the Indian government in 2007–08. The program's objectives were to: (i) raise public awareness of the negative effects of tobacco use; (ii) decrease the production and supply of tobacco products; and (iii) guarantee the effective enforcement of the provisions outlined in "The Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, COTPA 2003. (iv) assist individuals in quitting smoking, and (v) support the application of tobacco preventive and control techniques recommended by the WHO Framework Convention on Tobacco Control.

The National Tobacco Control Programme (NTCP) is organized into three levels: the Central level's National Tobacco Control Cell (NTCC), the State level's State Tobacco Control Cell (STCC), and the district level's District Tobacco Control Cell (DTCC). The establishment of district-level tobacco cessation services is another provision.

As a result of NTCP, resources and personnel have been allocated specifically for the Program's execution. Since the 12th Five Year Plan, the State/District Tobacco Control components (STCC and DTCC Plan) have been effectively implemented as part of the National Health Mission's (NHM) Flexi-pool for Non-Communicable Diseases (NCDs).

Presently, the Programme is being carried out in all 36 States and Union Territories, encompassing more than 600 districts nationwide.
The following are the primary areas of focus for the NTCP:

- Training for school teachers, law enforcement officials, NGOs, and health and social workers;
- School programs;
- Information, Education, and Communication (IEC) activities
- Keeping an eye on tobacco control laws;
- Collaborating with Panchayati Raj establishments on village-level initiatives;
- District-level pharmaceutical treatment facilities as well as the establishment and bolstering of cessation facilities.

2.4.3: WHO Framework Convention on Tobacco Control (WHO FCTC).

WHO Framework Convention on Tobacco Control (2003) The first international agreement negotiated under the WHO's auspices is the WHO Framework Convention on Tobacco Control (WHO FCTC). It became operative on February 27, 2005, after being approved by the World Health Assembly on May 21, 2003. From then on, it has grown to be one of the UN's most quickly and broadly ratified treaties ever. Reaffirming everyone's right to the best possible standard of health, the WHO Framework Convention on Tobacco Control was created in response to the tobacco epidemic's globalization. It is an evidence-based agreement.

New legal dimensions for international health cooperation are provided by the Convention, which is a significant milestone in the promotion of public health.

As per the Framework:

- In many public areas and workplaces, including healthcare, educational, and governmental institutions as well as on public transportation, smoking is strictly prohibited. On the other hand, smoking zones are allowed by law in airports, hotels with thirty rooms or more, and restaurants with thirty or more seats. Open-air venues such as stadiums, train stations, bus stops, and stands are all smoke-free. Smoke-free regulations that are stricter than federal legislation may be passed by subnational jurisdictions.
- It is against the law to advertise through the majority of mainstream media, including online content curation. Tobacco sponsorship and the publicizing of such sponsorship is subject to several limitations.
- Health advisory Labels on tobacco products are visual and textual, occupying 85% of the front and rear panels parallel to the top edge, and are changed out every 12 months. It is forbidden to use deceptive labelling and packaging, including phrases like "light," "low-tar," and other indicators.
- It is not authorized by law to control the ingredients in cigarettes. Manufacturers and importers are not required by law to provide government agencies with information on the ingredients and emissions of their products.
- It is against the law to sell tobacco products through vending machines or within 100 yards of any kind of educational facility. Furthermore, the selling of single cigarettes, gutka, and other smokeless tobacco products is prohibited in several states. The sale of single packages of cigarettes or other tobacco products, as well as sales via the Internet, are unrestricted. It is against the law to sell tobacco products to anyone less than 18 years old.
- The making, manufacturing, importing, exporting, transporting, selling, distributing, and promoting of electronic cigarettes is forbidden by law. The usage of electronic cigarettes is unrestricted.

- It is against the law to sell heated tobacco products (HTPs). The current smoking ban applies to HTPs. The promotion and advertising of tobacco devices and inserts, both direct and indirect, is prohibited by law.

2.4.4: Government of Mizoram Ban Tobacco.

Resource Center for Tobacco Control: Mizoram (2012) Government of Mizoram, Health and Family Welfare Department Vide Notification No.J.11011/28/2012-HFW Dated 27th August 2012, The Governor of Mizoram notify complete ban on sale of gutkha/pan masala/zarda and other chewable products containing tobacco and nicotine under Regulation 2,3,4 of the Food Safety and Standards (Prohibition and Restrictions on Safety Regulation 2011) which is effective from the day of notification and until further order.

CHAPTER-III
METHODOLOGY

3.1: Methodology.

This chapter describes the methodology adopted to examine the attitudes of Mizoram's healthcare professionals toward tobacco use and gives data on its prevalence and usage patterns. Since there isn't a specific document on the research domain among the targeted audience in the chosen state, the field for data gathering is rich.

This chapter deals with the methodology adopted in the present study. The design of the present investigation is systematically presented as follows:

1. Methodology
2. Research design:
3. Research setting
4. Population
5. Target Population
6. Accessible Population
7. Inclusion Criteria
8. Exclusion Criteria
9. Sampling technique
10. Sample size
11. Tools and technique
12. Development of the tool
13. Description of the tool
14. Validity of research tool.
15. Reliability of research tool.
16. Ethical Consideration.
17. Pilot Study
18. Methods and procedure of data collection.
19. Data Analysis.

3.2: Research design.

The research design chosen for this study is a Cross-sectional Survey research design.

3.3: Research setting.

The setting chosen for the study is Mizoram.

Mizoram is a state in India. Situated in the country's northeast, it is bordered to the east and south by Myanmar (Burma), to the west by Bangladesh, and to the northwest by the states of Tripura, Assam, and Manipur. Aizawl, located in the state's north-central region, serves as the capital. After being a union territory under central government in 1972 under the name Mizoram, it became a state in 1987. 21,081 square kilometres, or 8,139 square miles. 1,091,014 people lived there in 2011 (Lodrick 2024).

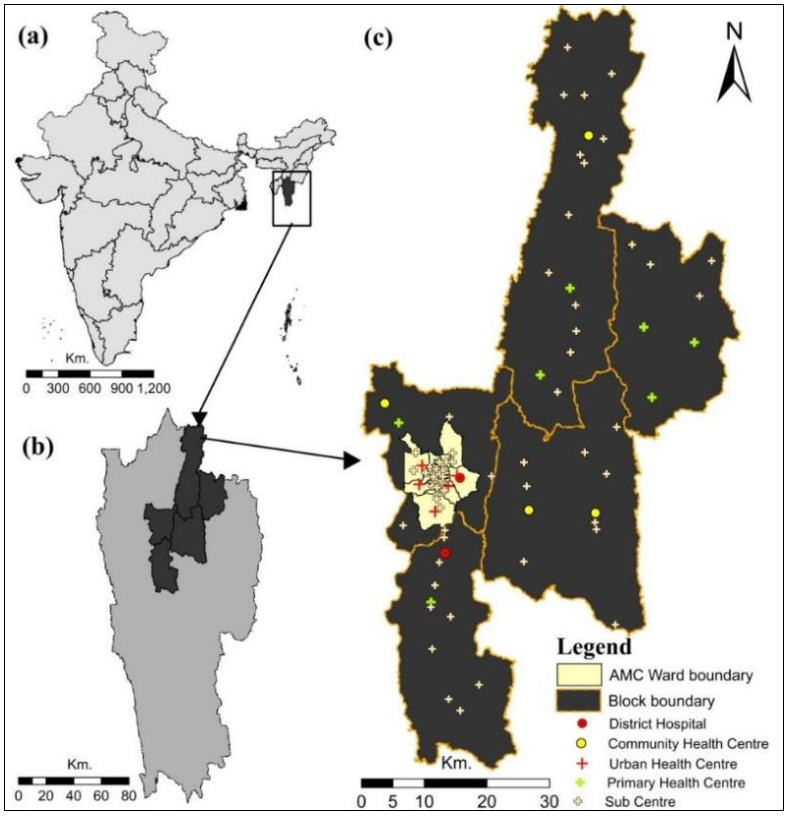

Fig 3.1. Geographical map highlighting the study area in Aizawl District, Mizoram, India. (Biswas et al. 2022).

Aizawl, city is the capital of Mizoram state, in northeastern region of India. It is situated in the north-central part of the state on a ridge at an elevation of about 2,950 feet (900 meters). When Mizoram was redesignated as a state in 1987, the city became its capital (Britannica 2024).

As per Mizoram Health and Family Welfare Department (2018). The healthcare institutions in Aizawl District are broadly categorized under Aizawl West District and Aizawl East District.

Aizawl West District has:

- Hospital-1
- Sub-District Hospital-1
- Private Hospital-4
- Community Health Centre – 1
- Primary Health Centre – 5
- Urban Primary Health Centre – 3
- Main Centre-8
- Sub-center-41
- Clinic-33

While Aizawl East District has

- Hospital-1
- Tertiary Centre-1
- Private Hospital-4
- Community Health Centre – 2
- Primary Health Centre – 5
- Urban Primary Health Centre – 3
- Main Centre-9
- Sub-center--55
- Clinic-35

3.4: Population.

The population for the study is healthcare professionals residing in Mizoram.

3.5: Target population.

Healthcare professionals particularly those in Mizoram who are employed as Doctors, Nurses, Dentists, Pharmacists, and Multipurpose Health Workers (MPHW) currently working in Mizoram are the target population.

3.6: Accessible population.

The accessible population is healthcare professionals such as Doctors, Nurses, Dentists, Pharmacists, and Multipurpose Health Workers (MPHW) currently working in Mizoram within the Aizawl District who can be contacted personally or online through email, WhatsApp, and phone calls.

3.7: Inclusion criteria.

Health Care Professional who is:

1) a doctor, nurse, dentist, pharmacist, and health workers
2) presently in service.
3) working within the Aizawl District.

3.8: Exclusion criteria.

1) Health Care Professionals who are chronically ill.
2) Health Care Professional who was in service for less than one year.

3.9: Sampling technique.

A combination of the Proportionate Stratified Sampling technique and convenience sampling is used. The total population for the study is calculated. The population is then stratified by profession into five (strata) Doctors, Nurses, Dentists, Pharmacists, and MPHWs. The number of elements from each stratum to its proportion from the total population is selected by taking a sampling fraction of 1/20 or 5% each. Once the required sample to represent each stratum is calculated, a unit from each stratum to participate in the study is selected by convenience sampling. Participants were selected base on their availability and willingness to participate in the study.

3.10: Sample size.

As per data obtained during March-April 2021 from reliable sources as follows:

- The Mizoram State Medical Council. The number of doctors registered in the council is 868,

- The Indian Dental Association Mizoram State Branch. The number of dentists registered is 250.
- The Mizoram Nursing Council. The number of Nurses registered is 4460
- The Mizoram State Pharmacy Council. The number of registered pharmacists is 642.
- The number of Multi-Purpose Health Workers (MPHW) is 1727.

Table 3.1. Number of populations for the different professions studied in this work.

PROFESSION	NUMBER OF POPULATION
DOCTORS	868
DENTISTS	250
NURSES	4460
PHARMACISTS	642
MPHW	1720
TOTAL	**7947**

The total population identified is 7947. The sampling process is initiated first by calculating the sample size using Slovin's Formula. From the entire population with 95% Confidence level and 5% Margin error the sample size required is identified as 367.

$n = N / (1 + Ne^2)$

Where:

- n = Number of samples,
- N = Total population and
- e = Error tolerance (level).

To ensure a representative sample from different facets of the target population, this study used a proportionate stratified random sampling approach. The first step involved stratifying the population (healthcare professionals) into five strata based on the professions such as doctors, dentists, nurses, pharmacists and MPHWs.

For determining the required sample size within each stratum, the following formula is employed to allocate proportional to stratum size.

$$\boldsymbol{n_i} = n\left(\frac{Ni}{N}\right)$$

where, $\boldsymbol{n}$ is the total number of sample units available for allocation, N_i is the size of each stratum, N is the size of the entire population and $\boldsymbol{n_i}$ is the number of sample units to allocate to stratum $\boldsymbol{i}$.

Or it can be simply calculated as follows:

Proportionate stratified random sample = (Sample size / Population size) × Stratum size

For Doctors $n_1 = 367\left(\frac{868}{7947}\right) = 40$

For Dentist $n_1 = 367\left(\frac{250}{7947}\right) = 12$

For Nurses $n_1 = 367\left(\frac{4460}{7947}\right) = 205$

For Pharmacist $n_1 = 367\left(\frac{642}{7947}\right) = 30$

For MPHW $n_1 = 367\left(\frac{1727}{7947}\right) = 80$

- ✓ The sample size formula adopted determined a sample size of, 40 doctors, 12 dentists, 205 nurses, 30 pharmacists, and 80 MPHWs a total of 367. A total of 367 healthcare professionals were selected from each stratum for the study.

Table 3.2. Population size and sample size for the different professions studied in this work.

STRATUM	DOCTORS	DENTIST	NURSES	PHARMACIST	MPHW	TOTAL
Population size	868	250	4460	642	1727	**7947**
Sample Size	40	12	205	30	80	**367**

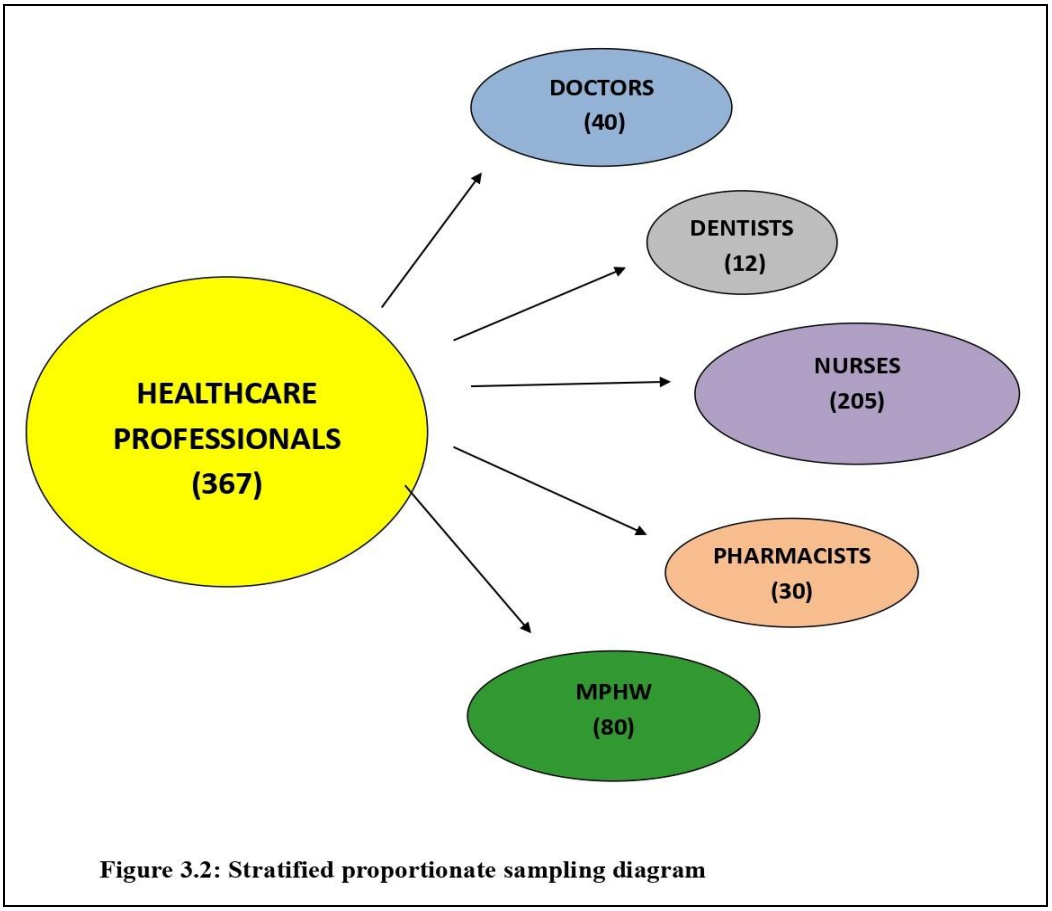

Fig 3.2. Stratified proportionate sampling size.

3.11: Tools and techniques.

The Healthcare Professionals Survey on Tobacco (HPST), a structured questionnaire, that was prepared specifically for this study, was the instrument used to collect data for the study.

3.12: Development of the tool.

The data collection tool was modified from the Global Health Professions Student Survey (GPHSS) (CDC 2007) and developed based on an extensive literature review using the Delphi method from experts in the field. Modifications were made to the tool to match the requirements of the study objectives.

3.13: Description of the tool.

The prepared data collection tool is a structured questionnaire named ***'Healthcare Professionals Survey on Tobacco (HPST)'*** that comprises six (6) parts.

Part I - is for the collection of the Demographic variables consisting of nine (9) questions.

Part II - is for the collection of data on Tobacco Use Prevalence which consists of six (6) questions.

Part III - is for the collection of data on Exposure to Environmental Tobacco Smoke which consists of four (4) questions.

Part IV - Multiple Choice Questions for the collection of data on participants' tobacco use Habits and Cessation which consists of eleven (11) questions.

Part V- Dichotomous questions for the collection of data on Curriculum/Training received by participants which consists of seven (7) questions.

Part VI- Likert Scale questions for the collection of data on the Attitudes of participants towards tobacco use which consists of twenty-four (24) questions.

3.14: Validity of research tool.

Pilot study participants provided face validity for the tool, which was determined to be "appropriate, and easy to understand." Ten experts (faculty from relevant departments) provided feedback on the tool's content validity, and their average proportional relevance was 0.98. Given that a cut-off score of S-CVI of >0.8 is regarded as reasonable, the scale content validity index of 0.985 and 0.852 was determined to be appropriate (Yusoff 2019, Polit et al 2007).

3.15: Reliability of research tool.

In terms of internal consistency and reliability, the questionnaire's Cronbach's alpha (α-0.894) was deemed adequate. A Cronbach's alpha of more than 0.7 is regarded as satisfactory (Taber 2018).

3.16: Ethical Consideration.

The Institutional Human Ethics Committee, Mizoram University, Tanhril, Aizawl, Mizoram after careful examination of the study protocol approved the study via letter No. MZU /HEC/2022/002 Dated 08.03.2022. The protocols adhered to were in compliance with both the institution's ethical guidelines and the 2013 revision of the Declaration of Helsinki. Before enrolment, each subject willingly provided their informed written consent. Additionally, the participants' data confidentiality and anonymity were guaranteed. No personal details such as name, phone number, or email IDs were collected from the participants ensuring their anonymity.

3.17: Pilot Study.

In June and July of 2022, a pilot study involving 65 healthcare professionals (16 % of the overall sample size) was carried out using the pen-and-paper method to evaluate the study's feasibility and the tool's psychometric testing for data collection. Pilot participants verified the tool's face validity, and found it to be "appropriate, and easy to understand." Based on the pilot study data, minor modifications were made to

the study tool, and plan for analysis. Thus, the study was considered feasible, and planned to proceed with the main studies.

3.18: Methods and procedure of data collection.

A hybrid form of data collection using a self-administered structured questionnaire 'Health Professionals Survey on Tobacco (HPST)', was employed to gather data. While a small portion of the data was gathered using the pen and paper method, the majority data was gathered online. The survey was created using a Google form, and it was distributed online via emails and WhatsApp. Data collection was done from January 2023- May 2023.

Data were collected in a hybrid method, online and offline using a self-administered questionnaire from 3rd Jan.2023 to 19th May.2023. **426 completed responses** were received and processed for analysis.

Table 3.3. Total population, sample size and data collected for the different professions studied in this work.

PROFESSION	TOTAL POPULATION	SAMPLE SIZE	DATA COLLECTED
DOCTORS	868	40	45
DENTISTS	250	12	17
NURSES	4460	205	236
PHARMACIST	642	30	40
MPHW	1727	80	88
TOTAL	**7947**	**367**	**426**

3.19: Data Analysis.

Data was analysed using the Statistical Package for the Social Sciences software (IBM SPSS Statistics for Windows, Version 25, IBM Corporation, Armonk, NY, USA).

Descriptive data were reported as frequency and percentage.

- When analysing qualitative (non-numerical) data, a chi-square test is used to compare observed and expected outcomes.
- Levene's test was conducted to test the homogeneity of variances, and then the one-way analysis of variance (ANOVA) is used to ascertain whether the means of three or more independent (unrelated) groups differ statistically significantly.
- The Kruskal-Wallis's test compares the mean rank on curriculum and training, exposure to tobacco smoke, tobacco use cessation, and attitude towards tobacco use among different professions under study.
- The degree to which different study parameters are associated with one another is measured by Spearman's rank correlation.
- A statistical test called multiple logistic regression is used to find out one or more binary variables for predicting attitudes and habits toward tobacco usage. It is also employed to ascertain the numerical correlation among a group of variables.
- All the statistical analyses were carried out at a 5% significance level.

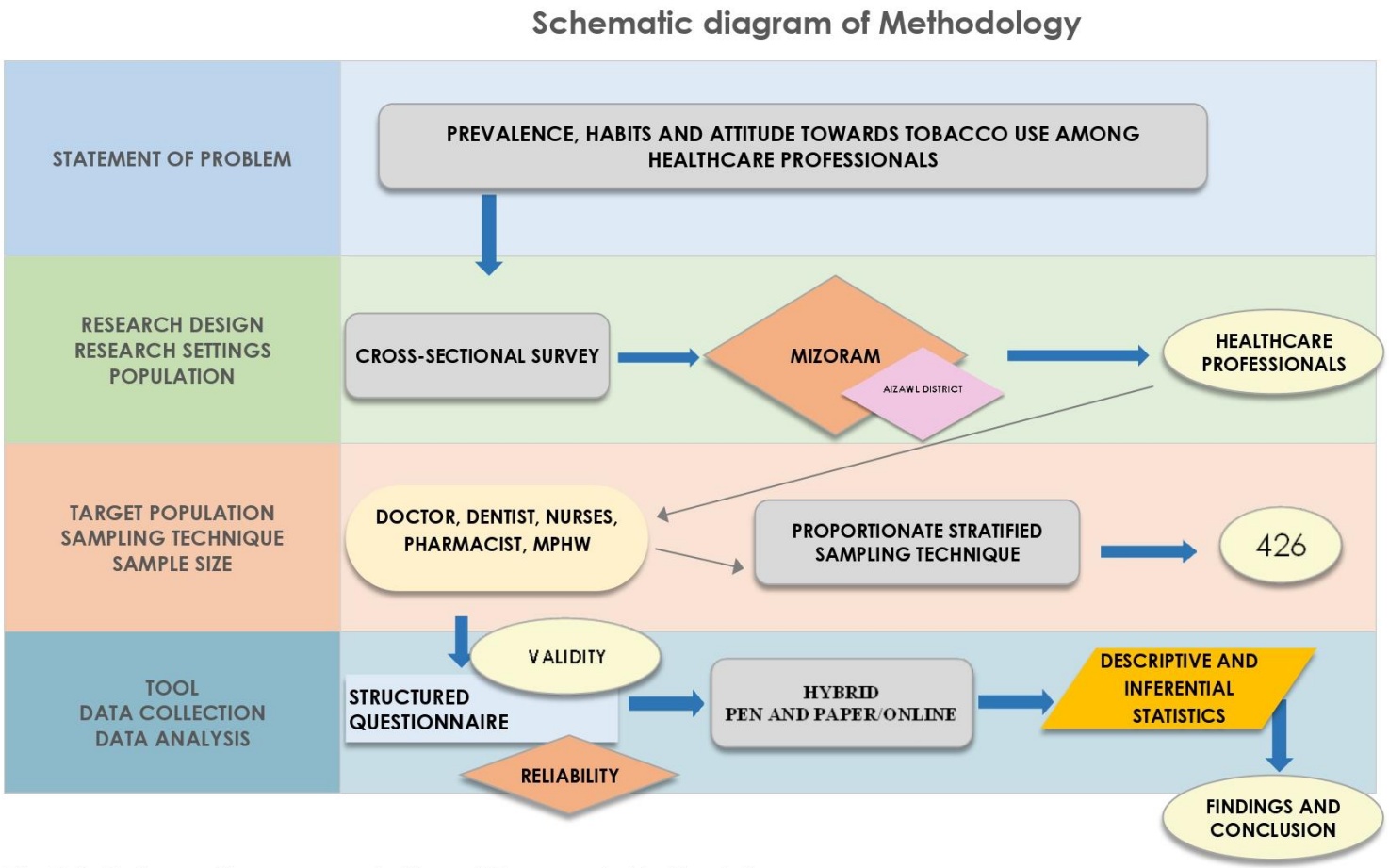

Fig.3.3. Schematic representation of Research Methodology

CHAPTER IV
ANALYSIS AND INTERPRETATIONS

This chapter addresses data analysis and interpretation. As mentioned in Chapter One the objectives of the study include identifying the prevalence of tobacco use, comparing the prevalence among the various professions, assessing the habits, evaluating attitudes, establishing relationships between prevalence and attitude, detecting association between prevalence and demographic variables, and finding association between attitude and demographic variables towards tobacco use among the healthcare professionals.

To address the objectives of the study, a data collection tool modified from the Global Health Professions Student Survey (GPHSS) and named *'Health Professional Survey on Tobacco (HPST)'* which is a self-administered questionnaire was used. The tool consists of five sections, with the first section being participants' demographic variables. The second section has six questions regarding tobacco use and prevalence, and the third section contains four items regarding exposure to environmental tobacco smoke. The fourth section has 11 multiple-choice questions related to participants' tobacco use habits and cessation, whereas, the fifth section consists of six dichotomous questions regarding previous training received by participants. The last section on attitude towards tobacco use has 24 Likert questions. The prepared stages of analysis were followed in processing data from 429 participants who matched the inclusion criteria, even though a minimum sample size of 367 was needed.

Data were analysed using the Statistical Package for the Social Sciences software (IBM SPSS Statistics for Windows, Version 25, IBM Corporation, Armonk, NY, USA). Descriptive data were reported as frequency and percentage. When analysing qualitative (non-numerical) data, a chi-square test is used to compare observed and expected outcomes. Levene's test was conducted to test the homogeneity of variances, and then the one-way analysis of variance (ANOVA) is used to ascertain whether the means of three or more independent (unrelated) groups differ statistically significantly. The Kruskal-Wallis's test compares the mean rank on curriculum and training, exposure to tobacco smoke, tobacco use cessation, and attitude towards tobacco use among different professions under study. The degree to which different study parameters are associated with one another is measured by

Spearman's rank correlation. A statistical test called multiple logistic regression is used to find out one or more binary variables for predicting attitudes and habits toward tobacco usage. It is also employed to ascertain the numerical correlation among a group of variables. All the statistical analyses were carried out at a 5% significance level

Using the proper statistical procedures, the data was analysed, and the results were also interpreted with consideration for the study's goals, which aligned with the objectives and hypothesis mentioned in the first chapter as follows:

Objective of the study.

1. To identify the prevalence of tobacco use among healthcare professionals.
2. To compare the prevalence of tobacco use among healthcare professionals.
3. To assess the habit of health care professionals on tobacco use.
4. To evaluate the attitude of health care professionals on tobacco use.
5. To inspect a relationship between the prevalence of tobacco use and attitude among health care professionals.
6. To find out the association between the attitude of health care professionals on tobacco use with their selected demographic variables.
7. To detect the association between the prevalence of tobacco use among healthcare professionals with their selected demographic variables.

Hypothesis.

H_1 There is a significant relationship between the prevalence of tobacco use and attitude among healthcare professionals.

H_2 There is a significant association between attitudes toward tobacco use among healthcare professionals and their selected demographic variables.

H_3 There is a significant association between tobacco use prevalence among healthcare professionals and their selected demographic variables.

4.1: Socio-demographic characteristics of healthcare professionals under study.

From this study, various demographic parameters were taken from the responder. The percentage of the composition within each demographic parameters are as follows: age (18–29 = 35.4%; 30–39 = 33.6%; 40–49 = 18.8%; 50–59 = 12.2%; Fig. 4.1); gender (male = 17.6%; female = 82.4%; Fig. 4.1); Religion (Christian = 98.6%; Hindu = 0.5%; others = 0.9%; Fig. 4.2); marital status (single = 50.2%; Married = 46.2%; Divorced = 2.3%; Widowed = 1.2%; Fig. 4.2); food habits (non-vegetarian = 93.0%; vegetarian = 5.2%; vegan = 1.9%; Fig. 4.3); profession (doctor = 10.6%; dentist = 9.4%; nurse = 55.4%; pharmacist = 9.4%; MPHW = 4.0%; Fig. 4.3); organization (government = 65.49%; mission = 10.57%; private = 23.94%; Fig. 4.4); work experience (≤10 years = 58.9%; 11–20 years = 20.2%; ≥21 years = 20.9%; Fig. 4.4); family type (joint = 35.7%; nuclear = 60.1%; extended = 4.2%; Fig. 4.5).

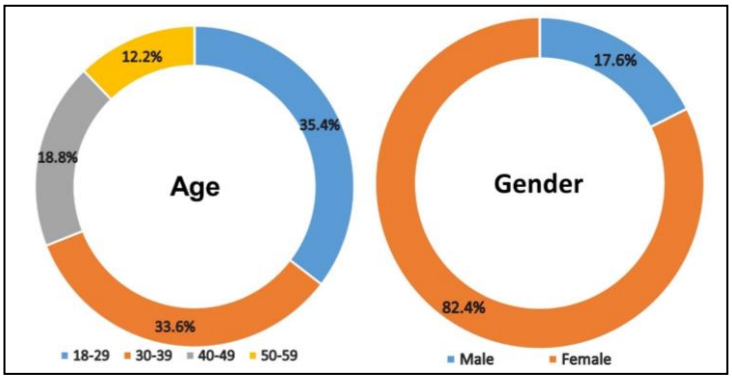

Figure 4.1. Pie-chart showing the percentage of age groups (left) and genders (right) among participants.

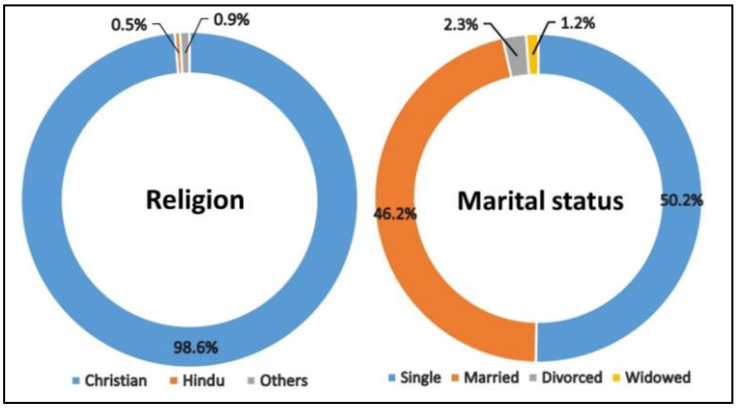

Figure 4.2. Pie-chart showing the percentage of religions (left) and marital status (right) among participants.

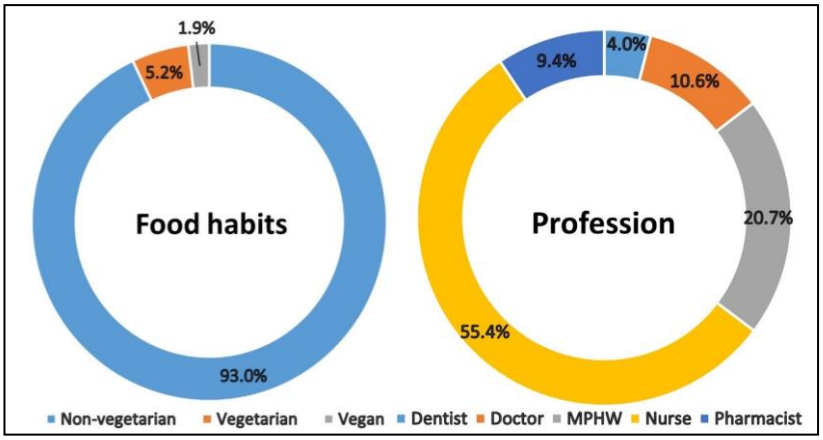

Figure 4.3. Pie-chart showing the percentage of food habits (left) and profession (right) among participants.

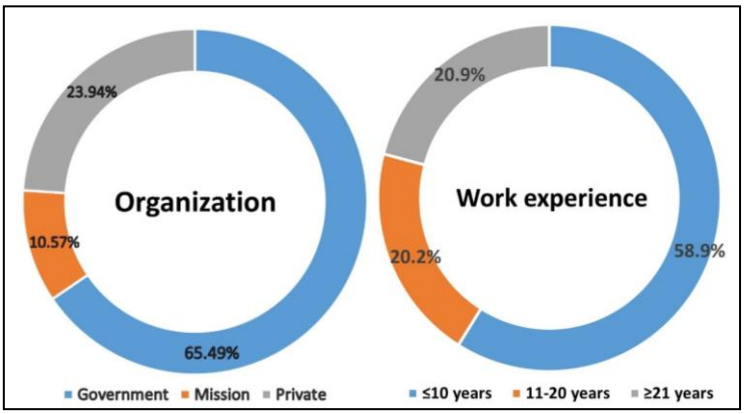

Figure 4.4. Pie-chart showing the percentage of organization (left) and work experience (right) among participants.

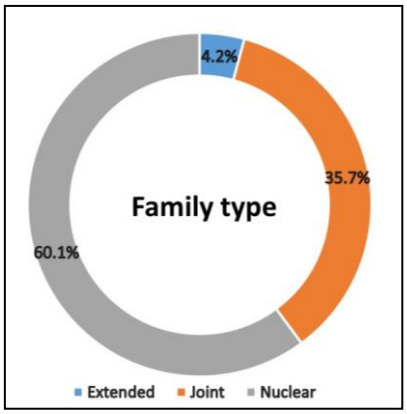

Figure 4.5. Pie-chart showing the percentage of family types among participants.

4.2: Degree of tobacco use prevalence among healthcare professionals under study.

The survey on prevalence of tobacco usage among the overall healthcare professionals under studied (n=426) showed that there are 201(47.2 %) current user of tobacco comprised by 6 from dentists, 24 from doctors, 51 from MPHW, 99 from nurses, and 21 from pharmacists; while there are 225 (52.8 %) who are currently non-user of tobacco comprised by 11 from dentists, 21 from doctors, 37 from MPHW, 137 from nurses, and 19 from pharmacists. The difference in the frequency distribution of current users of tobacco across the different professions is statistically significant ($p<0.01$); the difference in the frequency distribution of those who are currently not using tobacco across the different professions is also statistically significant ($p<0.001$). Moreover, the difference in the frequency distribution of smoking tobacco users across the different professions is statistically significant ($p<0.01$); the difference in the frequency distribution of smokeless tobacco users across the different professions is statistically significant ($p<0.001$). But, the difference in the frequency distribution of both smoking and smokeless tobacco users across the different professions is not statistically significant ($p=0.392$).

Among the participants, a total of 39 responded as smoking tobacco users, 145 as smokeless tobacco users, while 17 as both smoking and smokeless tobacco users. Among dentists, users of smoking and smokeless forms of tobacco are represented by 3 each, while users of both forms of tobacco is nil for this profession. Among doctors, users of smokeless tobacco constituting the highest frequency (14), followed by smoking (8), and the least for both forms of tobacco (2). Among MPHW, users of smokeless tobacco constituting the highest frequency (30), followed by smoking (17), and the least for both forms of tobacco (4). Among nurses, users of smokeless tobacco constituting the highest frequency (87), followed by users of both forms of tobacco (7), and the least for smokers (5). Among pharmacists, users of smokeless tobacco constituting the highest frequency (11), followed by smoking (6), and the least for both forms of tobacco (4). These differences in the frequency distribution within all the professions for the types of

tobacco usage is statistically significant in each profession viz. dentists ($p<0.05$); doctors ($p<0.01$); MPHW ($p<0.001$); nurses ($p<0.001$); and pharmacists ($p<0.01$).

A total of 305 (71.6%) participants have tried or experimented with cigarette smoking even one or two puffs, while 121 (28.4%) participants have never tried or experimented cigarette smoking. The differences in the frequency distribution within all the professions whether they have experimented or tried for cigarette smoking for even one or two puffs is statistically significant within the following professions except within MPHW viz. dentists ($p<0.001$); doctors ($p<0.001$); nurses ($p<0.001$); and pharmacists ($p<0.001$).

Among the participants, 24 were 10 years old or younger when they first tried their cigarette smoking, while 72 were 11–15 years old, 42 were 16–17 years old, 61 were 18–19 years old, 83 were 20–29 years old, and 23 were 30 years old or older. The frequency difference in the age group within each profession on how old the participants were when they tried cigarette smoking for the first time is also statistically significant among MPHW ($p<0.001$; highest in 20–29 years old (16); lowest in 10 years or younger (2); nurses ($p<0.001$; highest in 20–29 years old (51); lowest in 16–17 years (12) and 30 years or older (12); and pharmacists ($p<0.05$; highest in 18–19 years old (12); lowest in 10 years or younger (1).

Among the participants, a total of 266 (62.4%) have used smokeless tobacco while 160 (37.6%) of them have never used. The frequency difference on whether the participants have ever used smokeless tobacco or not is statistically significant among MPHW ($p<0.01$; have used=59, never used=29); nurses ($p<0.01$; have used=139, never used=97); and pharmacists ($p<0.01$; have used=29, never used=11) (Table 4.1).

Table 4.1 Frequency distribution and percentage for tobacco use prevalence among healthcare professions under studied (n-number of participants; %-percentage CI-Confidence interval). The p value for the statistically significant parameters were indicated in bold.

Questions	All		Doctors n=45	Dentists n=17	Nurses n=236	Pharmacists n=40	MPHW n=88
	n=426	% (95% CI)					
Current use of tobacco							
Yes	201	47.2 (42.4-52.0)	24 (53.3)	6 (35.3)	99 (41.9)	21 (52.5)	51 (58.0)
No	225	52.8 (48.0-57.6)	21 (46.7)	11 (64.7)	137 (58.1)	19 (47.5)	37 (42.0)
Chi-square Test across profession (User of tobacco)	-	-	**p<0.01**; χ^2=15.231; df=4				
Chi-square Test across profession (Non user of tobacco)	-	-	**p<0.001**; χ^2=243.022; df=4				
Chi-square Test across profession (User of smoking tobacco)	-	-	**p<0.01**; χ^2=15.231; df=4				
Chi-square Test across profession (User of smokeless tobacco)	-	-	**p<0.001**; χ^2=158.276; df=4				
Chi-square Test across profession (User of both smoking and smokeless tobacco)	-	-	p=0.392; χ^2=3.00; df=3				
What form of tobacco do you currently use?							
Smoking	39	9.2 (6.6-12.3)	8 (17.8)	3 (17.6)	5 (2.1)	6 (15.0)	17 (19.3)
Smokeless	145	34.0 (29.5-38.8)	14 (31.1)	3 (17.6)	87 (36.9)	11 (27.5)	30 (34.1)
Both smoking and smokeless	17	4.0 (2.3-6.3)	2 (4.4)	0	7 (3.0)	4 (10.0)	4 (4.5)
Chi-square Test within profession (What form of tobacco do you currently use?)	-	-	**p<0.01**; χ^2=17.667; df=3	**p<0.05**; χ^2=7.529; df=2	**p<0.001**; χ^2=211.661; df=3	**p<0.01**; χ^2=13.400; df=3	**p<0.001**; χ^2=29.000; df=3
Have you ever tried or experimented with cigarette smoking even one or two puffs?							
Yes	305	71.6 (67.1-75.8)	37 (82.2)	16 (94.1)	167 (70.8)	32 (80.0)	53 (60.2)
No	121	28.4 (24.2-32.9)	8 (17.8)	1 (5.9)	69 (29.2)	8 (20.0)	35 (39.8)
Chi-square Test within profession (Have you ever tried or experimented with cigarette smoking even one or two puffs?)	-	-	**p<0.001**; χ^2=18.689; df=1	**p<0.001**; χ^2=13.235; df=1	**p<0.001**; χ^2=31.339; df=1	**p<0.001**; χ^2=14.400; df=1	p=0.394; χ^2=0.727; df=1
How old were you when you first tried a cigarette?							
10 years or younger	24	7.9 (5.1-11.5)	2 (5.4)	2 (12.5)	17 (10.2)	1 (3.1)	2 (3.8)
11-15 years	72	23.6 (19.0-28.8)	9 (24.3)	4 (25.0)	40 (24.0)	5 (15.6)	14 (26.4)
16-17 years	42	13.8 (10.1-18.2)	8 (21.6)	4 (25.0)	12 (10.2)	7 (21.9)	6 (11.3)
18-19 years	61	20.0 (15.7-24.9)	6 (16.2)	1 (6.3)	30 (18.0)	12 (37.5)	12 (22.6)

20-29 years	83	27.2 (22.3-32.6)	7 (18.9)	4 (25.0)	51 (30.5)	5 (15.6)	16 (30.2)
30 years or older	23	7.5 (4.8-11.1)	5 (13.5)	1 (6.3)	12 (7.2)	2 (6.3)	3 (5.7)
Chi-square Test within profession (How old were you when you first tried a cigarette?)	-	-	p=0.513 ; χ^2=5.244; df=6	p=0.464; χ^2=5.647 ; df=6	**p<0.001**; χ^2=77.932; df=6	**p<0.05**; χ^2=14.600 ; df=6	**p<0.001**; χ^2=60.750 ; df=6
Have you ever used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan, or tuibur (tobacco brew)?							
Yes	266	62.4 (57.7-67.1)	29 (64.4)	10 (58.8)	139 (58.9)	29 (72.5)	59 (67.0)
No	160	37.6 (32.9-42.3)	16 (35.6)	7 (41.2)	97 (41.1)	11 (27.5)	29 (33.0)
Chi-square Test within profession (Have you ever used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan, or tuibur (tobacco brew)?)	-	-	p=0.053 ; χ^2=3.756; df=1	p=0.467; χ^2=0.529 ; df=1	**p<0.01**; χ^2=7.475 ; df=1	**p<0.01**; χ^2=8.100; df=1	**p<0.01**; χ^2=10.227 ; df=1

4.3: Comparison of the prevalence of tobacco use among healthcare professionals.

Prior conducting analyses, the parameters of prevalence and habits on tobacco usage were tested for Levene's test for the homogeneity of variances ($p>0.05$) and is determined to be suitable for further analysis using one-way ANOVA (Table 4.2). The test on one-way ANOVA for the prevalence of tobacco use across different professions showed statistically significant difference ($p<0.05$) (Table 4.3; Fig. 4.6). But, pos hoc test do not determine statistically significant difference between each of the professions (Table 4.4).

Table 4.2. Levene's test for homogeneity of variances.

	Levene Statistic	**df1**	**df2**	**Sig.**
Tobacco use prevalence	1.833	4	421	0.121
Tobacco use habits	2.267	4	421	0.061

Table 4.3. One-way ANOVA to compare the prevalence of tobacco use among healthcare professionals using professions as factor.

		Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Tobacco use prevalence	Between Groups	452.521	4	113.130	2.672	**<0.05**
	Within Groups	17823.469	421	42.336		
	Total	18275.991	425			

Table 4.4. Pos-hoc test on the prevalence of tobacco use across different healthcare professionals.

Professions		p value
Doctors	Dentists	0.859
	Nurses	0.364
	Pharmacists	1.000
	MPHW	1.000
Dentists	Doctors	0.859
	Nurses	1.000
	Pharmacists	0.836
	MPHW	0.889
Nurses	Doctors	0.364
	Dentists	1.000
	Pharmacists	0.350
	MPHW	0.237
Pharmacists	Doctors	1.000
	Dentists	0.836
	Nurses	0.350
	MPHW	0.998
MPHW	Doctors	1.000
	Dentists	0.889
	Nurses	0.237
	Pharmacists	0.998

The test on one-way ANOVA for the habits of tobacco use across different professions also showed statistically significant difference ($p<0.001$) (Table 4.5; Fig. 4.7). Moreover, pos hoc determined statistically significant difference between nurses and MPHW ($p<0.001$) (Table 4.6).

Table 4.5. One-way ANOVA to compare tobacco use habits among healthcare professionals using professions as factor.

		Sum of Squares	df	Mean Square	F	Sig.
Tobacco use habits	Between Groups	447.882	4	111.970	8.029	**<0.001**
	Within Groups	5871.116	421	13.946		
	Total	6318.998	425			

Table 4.6. Pos-hoc test on tobacco use habits among healthcare professionals. The p value for the statistically significant parameters were indicated in bold.

Profession		p value
Doctors	Dentists	0.926
	Nurses	0.096
	Pharmacists	1.000
	MPHW	0.909
Dentists	Doctors	0.926
	Nurses	0.966
	Pharmacists	0.919
	MPHW	0.574
Nurses	Doctors	0.096
	Dentists	0.966
	Pharmacists	0.110
	MPHW	**<0.001**
Pharmacists	Doctors	1.000
	Dentists	0.919
	Nurses	0.110
	MPHW	0.938
MPHW	Doctors	0.909
	Dentists	0.574
	Nurses	**<0.001**
	Pharmacists	0.938

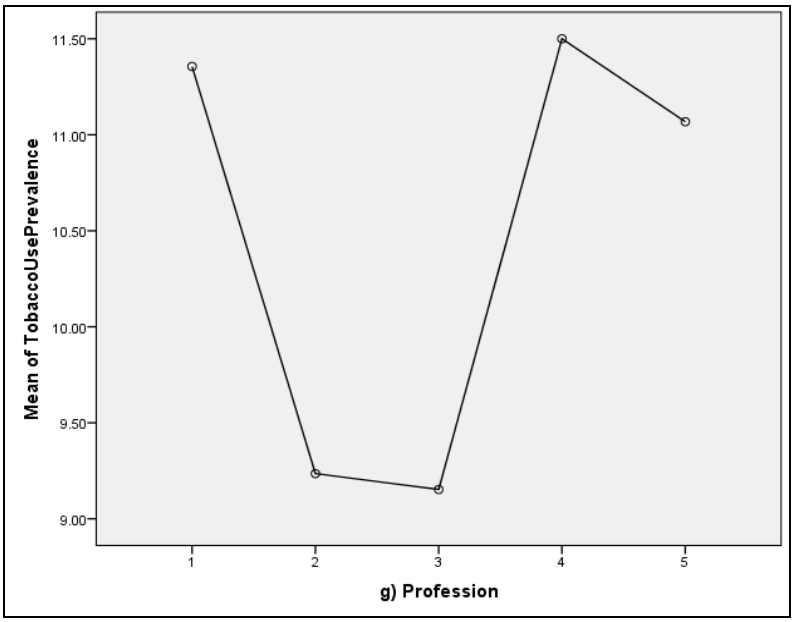

Figure 4.6. Mean of the prevalence of tobacco use among different healthcare professionals. The professions given at x-axis are: 1. Doctors, 2. Dentists, 3. Nurses, 4. Pharmacists, 5. MPHW.

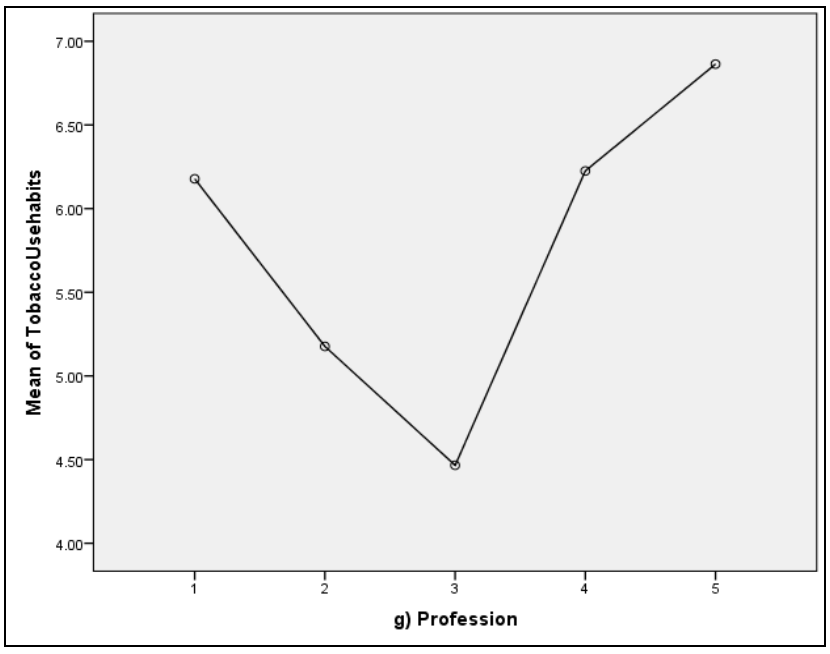

Figure 4.7. Mean of tobacco use habits among different healthcare professionals. The professions given at x-axis are: 1. Doctors, 2. Dentists, 3. Nurses, 4. Pharmacists, 5. MPHW.

4.4: Nature of tobacco use habits among the healthcare professionals.

The analyses on tobacco use habits among the healthcare professionals are performed by pooling professions. The frequency difference on how soon the participants smoked his/her first cigarette after waking up is statistically significant ($p<0.01$; highest after 60 minutes (30; 53.6%) during 0–5 mins (9; 16.1%) and 31–60 mins (9; 16.1%), lowest during 6–30 mins (8; 14.3%). A total of 20 (35.7%) participants did find it difficult to refrain from smoking in places where it is prohibited, while 36 (64.3%) of them did not find it difficult to refrain ($p<0.05$). The frequency on the amount of cigarette smoked per day is also highest for 10 or less (40; 71.4%) and lowest for 21–30 cigarettes, and this frequency distribution is also statistically significantly different ($p<0.001$). A total of 17 (30.4%) participants smokes more frequently during the first hours after waking than during the rest of the day while 39 (69.6%) of them do not implement this habit; the frequency difference is also statistically significant ($p<0.01$). The frequency of participants who smoke even when they are so ill that they are in bed most of the day is lower (14; 25%) compared to those who never smoke in such kind of condition (42; 75%), and the frequency difference is statistically significant ($p<0.01$). A total of 47 (83.9%) participants want to stop smoking cigarette now while 9 (16.1%) of them did not want to stop smoking, and the frequency difference is statistically significant ($p<0.001$). A total of 34 (60.7%) have tried to stop smoking cigarettes during the past year, while 22 (39.3%) have never been trying to stop smoking during the past years, and the frequency difference is also statistically significant ($p<0.001$) (Table 4.7).

Table 4.7: Frequency distribution and percentage for Smoking habits among healthcare professionals under studied who are smokers (n=56) (CI-Confidence interval). The p value for the statistically significant parameters were indicated in bold.

Questions	Frequency	Percentage (95%CI)	Chi-square Test (regardless of profession)
During the past 30 days (one month), on how many days did you smoke cigarettes?			**p<0.001**; χ^2=51.827; df=6
0 day	4	7.1 (2.0-17.3)	
1 to 2 days	7	12.5 (5.2-24.1)	
3 to 5 days	5	8.9 (3.0-19.6)	
6 to 9 days	3	5.4 (1.1-14.9)	
10 to 19 days	7	12.5 (5.2-24.1)	
20 to 29 days	2	3.6 (0.4-12.3)	
All 30 days	28	50.0 (36.3-63.7)	
Have you smoked cigarettes on hospital/Clinic/Institute/sub-center premises during the past year?			p=0.423; χ^2=0.643; df=1
Yes	25	44.6 (31.3-58.5)	
No	31	55.4 (41.5-68.7)	
How soon after you wake up do you smoke your first cigarette?			**p<0.01**; χ^2=18.786; df=5
0-5 minutes	9	16.1 (7.6-28.3)	
6-30 minutes	8	14.3 (6.4-26.2)	
31-60 minutes	9	16.1 (7.6-28.3)	
After 60 minutes	30	53.6 (39.7-67.0)	
Do you find it difficult to refrain from smoking in places where it is forbidden (eg. Church, library, cinema, etc)?			**p<0.05**; χ^2=4.571; df=1
Yes	20	35.7 (23.4-49.6)	
No	36	64.3 (50.4-76.6)	
How many cigarettes per day do you smoke?			**p<0.001**; χ^2=36.714; df=3
10 or less	40	71.4 (57.8-82.7)	
11-20	12	21.4 (11.6-34.4)	
21-30	4	7.1 (2.0-17.3)	
Do you smoke more frequently during the first hours after waking than during the rest of the day?			**p<0.01**; χ^2=8.643; df=1
Yes	17	30.4 (18.8-44.1)	
No	39	69.6 (55.9-81.2)	

Do you smoke even when you are so ill that you are in bed most of the day?			**p<0.001**; χ^2=14.00; df=1
Yes	14	25.0 (14.4-38.4)	
No	42	75.0 (61.6-85.6)	
Do you want to stop smoking cigarettes now?			**p<0.001**; χ^2=14.00; df=2
Yes	47	83.9 (71.7-92.4)	
No	9	16.1 (7.6-28.3)	
During the past year, have you ever tried to stop smoking cigarettes?			**p<0.001**; χ^2=24.250; df=2
Yes	34	60.7 (46.8-73.5)	
No	22	39.3 (26.5-53.2)	

During the past 30 days (one month), 84 (51.9%) of the participants have used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) during all 30 days, while those who used only 6 to 9 days is the least (5; 3.1%) with a statistically significant frequency distribution (p<0.001). A total of 136 (84.0%) participants have used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) in the hospital/Clinic/Institute/ Sub center's premises during the past year while 26 (16.0%) have never used smokeless tobacco in the aforementioned premises, and the frequency difference is statistically significant (p<0.001). The frequency difference on how soon the participants used his/her first smokeless tobacco after waking up is statistically significant (p<0.001; highest after 60 mins (79; 48.8%), lowest during 31–60 mins (25; 15.4%). A total of 47 (29.0%) participants did find it difficult to refrain from using smokeless tobacco in places where it is prohibited, while 115 (71.0%) of them did not find it difficult to refrain (p<0.001). A total of 34 (21.0%) participants used smokeless tobacco more frequently during the first hours after waking than during the rest of the day while 128 (79.0%) of them do not implement this habit; the frequency difference is also statistically significant (p<0.001). The frequency of participants who used smokeless tobacco even when they are so ill that they are in bed most of the day is lower (43; 26.5%) compared to those who never used smokeless tobacco in such kind of condition (119; 73.5%), and the frequency difference is statistically significant (p<0.001). A total of 132 (81.5%) participants want to stop using smokeless tobacco

now while 30 (18.5%) of them did not want to stop using smokeless tobacco, and the frequency difference is statistically significant (p<0.001). (Table 4.8).

Table 4.8: Frequency distribution and percentage for smokeless tobacco-use habits among healthcare professionals under studied who are smokeless tobacco users (n=162) (CI-Confidence interval).

Questions	Frequency	Percentage (95%CI)	Chi-square Test (regardless of profession)
During the past 30 days (one month), on how many days did you use smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew)?			**p<0.001**; χ^2=202.951; df=6
1 to 2 days	32	19.8 (13.9-26.7)	
3 to 5 days	13	8.0 (4.3-13.3)	
6 to 9 days	5	3.1 (1.0-7.1)	
10 to 19 days	19	11.7 (7.2-17.7)	
20 to 29 days	9	5.6 (2.6-10.3)	
All 30 days	84	51.9 (43.9-59.8)	
Have you used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) in the hospital/Clinic/Institute/ Sub center's premises during the past year?			**p<0.001**; χ^2=191.259; df=2
Yes	136	84.0 (77.4-89.2)	
No	26	16.0 (10.8-22.6)	
How soon after you wake up do you use your first smokeless tobacco?			**p<0.001**; χ^2=77.525; df=5
0-5 minutes	27	16.7 (11.3-23.3)	
6-30 minutes	31	19.1 (13.4-26.0)	
31-60 minutes	25	15.4 (10.2-21.9)	
After 60 minutes	79	48.8 (40.8-56.7)	
Do you find it difficult to refrain from use of smokeless tobacco in places where it is forbidden (eg. Church, library, cinema etc)?			**p<0.001**; χ^2=28.543; df=1
Yes	47	29.0 (22.2-36.7)	
No	115	71.0 (63.3-77.8)	
Do you use smokeless tobacco more frequently during the first hours after waking than during the rest of the day?			**p<0.001**; χ^2=126.333; df=2
Yes	34	21.0 (15.0-28.1)	
No	128	79.0 (71.9-85.0)	
Do you use smokeless tobacco even when			**p<0.001**;

you are so ill that you are in bed most of the day?			χ^2=113.444; df=2
Yes	43	26.5 (19.9-34.0)	
No	119	73.5 (66.0-80.1)	
Do you want to stop using smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan, or tuibur (tobacco brew)?			**p<0.001**; χ^2=106.926; df=2
Yes	132	81.5 (74.6-87.1)	
No	30	18.5 (12.9-25.4)	

4.5: Exposure to Environmental Smoke among the healthcare professional under study.

The exposure to environmental smoke was assessed and analyzed among the five different professions using chi-square test. In this test, observed and expected frequencies are tested whether there is association between exposure to environmental smoke with respect to healthcare professionals, and whether the difference in frequency distribution is statistically significant. The frequency distributions were compared separately for each profession on the following parameters and were found statistically significant as mentioned in parentheses:

a) Differences in the frequency distribution on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days is statistically significant in doctors [p<0.001; lowest for 5 to 6 days (2) and highest for 0 day (26); Table 4.9, 4.10; Fig. 4.8], dentists [p<0.01; lowest for 4 to 5 days (1) and highest for 0 day (11); Table 4.11, 4.12; Fig. 4.9], nurses [p<0.001; lowest for 5 to 6 days (7) and highest for 0 day (129); Table 4.13, 4.14; Fig. 4.10], pharmacists [p<0.01; lowest for 4 to 5 days (3) and highest for 0 day (18); Table 4.15, 4.16; Fig. 4.11], and MPHW [p<0.001; lowest for 5 to 6 days (3) and highest for 0 day (35); Table 4.17, 4.18; Fig. 4.12].

b) Differences in the frequency distribution on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days is statistically significant in doctors [$p<0.01$; lowest for 5 to 6 days (1) and highest for 1 to 2 days (15); Table 4.19, 4.20; Fig. 4.13], nurses [$p<0.001$; lowest for 5 to 6 days (13) and highest for 1 to 2 days (85); Table 4.23, 4.24; Fig. 4.15], pharmacists [$p<0.01$; lowest for 5 to 6 days (2) and highest for 1 to 2 days (17); Table 4.25, 4.26; Fig. 4.16], and MPHW [$p<0.001$; lowest for 5 to 6 days (4) and highest for all 7 days (25); Table 4.27, 4.28; Fig. 4.17].

c) Differences in the frequency distribution on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place is statistically significant doctors [$p<0.001$; lowest for No (4) and highest for Yes (41); Table 4.29, 4.30; Fig. 4.18], dentists [$p<0.01$; lowest for No (3) and highest for Yes (14); Table 4.31, 4.32; Fig. 4.19], nurses [$p<0.001$; lowest for No (30) and highest for Yes (206); Table 4.33, 4.34; Fig. 4.20], pharmacists [$p<0.001$; lowest for No (7) and highest for Yes (33); Table 4.35, 4.36; Fig. 4.21], and MPHW [$p<0.001$; lowest for No (21) and highest for Yes (67); Table 4.37, 4.38; Fig. 4.22].

d) Differences in the frequency distribution on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced.is statistically significant doctors [$p<0.001$; lowest for No official policy (4) and highest for Yes (34); Table 4.39, 4.40; Fig. 4.23], dentists [$p<0.01$; lowest for No (3) and highest for Yes (14); Table 4.41, 4.42; Fig. 4.24], nurses [$p<0.001$; lowest for No (15) and highest for Yes (199); Table 4.43, 4.44; Fig. 4.25], pharmacists [$p<0.001$; lowest for No official policy (5) and highest for Yes (29); Table 4.45, 4.46; Fig. 4.26], and MPHW [$p<0.001$; lowest for No (8) and highest for Yes (65); Table 4.47, 4.48; Fig. 4.27].

Table 4.9. The observed, expected and residual frequencies on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (doctors).

	Observed	Expected	Residual
0 day	26	9.0	17.0
1 to 2 days	6	9.0	-3.0
3 to 4 days	4	9.0	-5.0
5 to 6 days	2	9.0	-7.0
All 7 days	7	9.0	-2.0
Total	45		

Table 4.10. Test statistics based on Chi-square goodness-of-fit test on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (doctors).

Chi-Square	**41.778[b]**
df	4
p value	**<0.001**

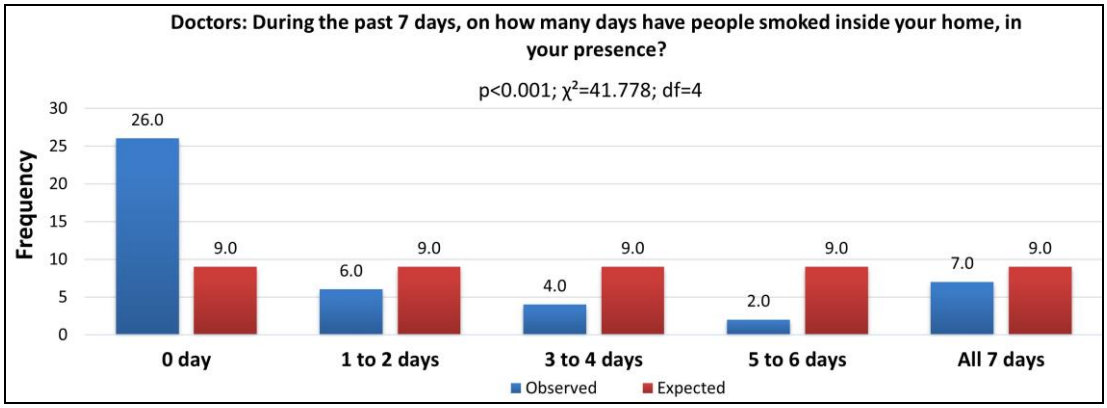

Figure 4.8. Bar diagram showing the observed and expected frequencies on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (doctors) (n=45).

Table 4.11. The observed, expected and residual frequencies on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (dentists).

	Observed	Expected	Residual
0 day	11	4.3	6.8
1 to 3 days	2	4.3	-2.3
4 to 5 days	1	4.3	-3.3
All 7 days	3	4.3	-1.3
Total	17		

Table 4.12. Test statistics based on Chi-square goodness-of-fit test on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (dentists).

Chi-Square	**14.765[b]**
df	3
p value	**<0.01**

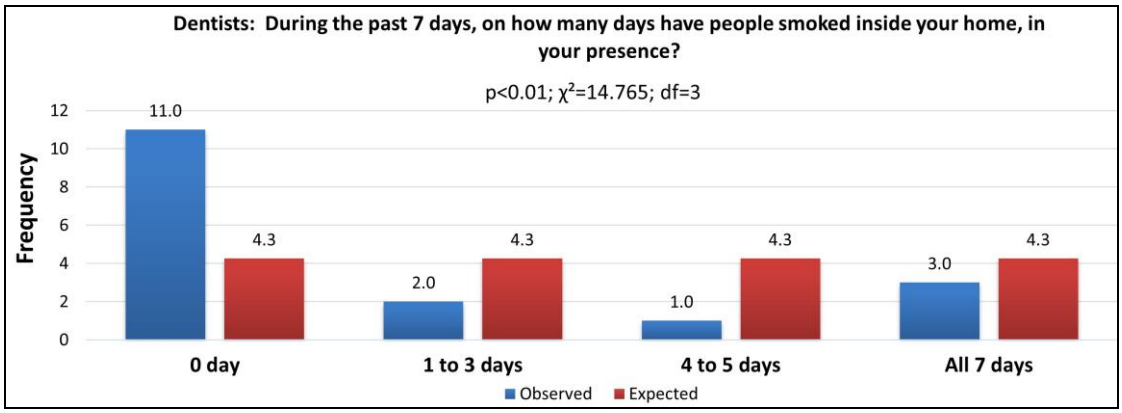

Figure 4.9. Bar diagram showing the observed and expected frequencies on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (dentists) (n=17).

Table 4.13. The observed, expected and residual frequencies on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (nurses).

	Observed	Expected	Residual
0 day	129	47.2	81.8
1 to 2 days	46	47.2	-1.2
3 to 4 days	18	47.2	-29.2
5 to 6 days	7	47.2	-40.2
All 7 days	36	47.2	-11.2
Total	236		

Table 4.14. Test statistics based on Chi-square goodness-of-fit test on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (nurses).

Chi-Square	**196.754[b]**
df	4
p value	**<0.001**

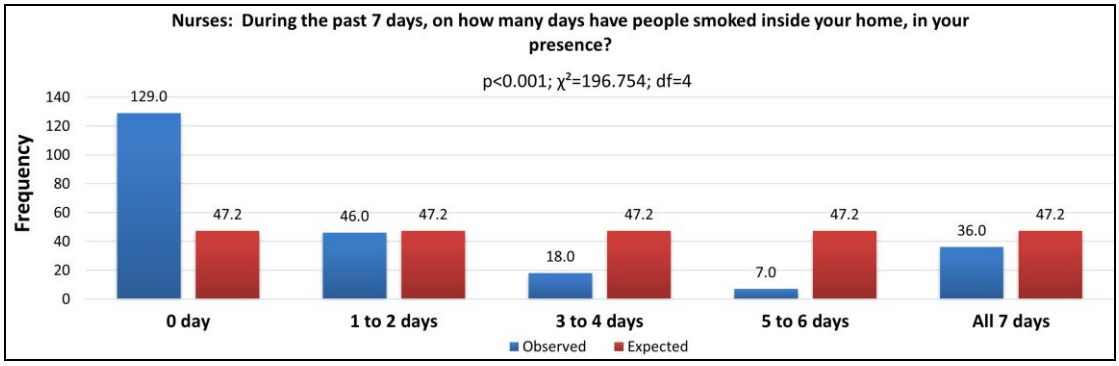

Figure 4.10. Bar diagram showing the observed and expected frequencies on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (nurses) (n=236).

Table 4.15. The observed, expected and residual frequencies on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (pharmacists).

	Observed	Expected	Residual
0 day	18	10.0	8.0
1 to 3 days	8	10.0	-2.0
4 to 5 days	3	10.0	-7.0
All 7 days	11	10.0	1.0
Total	40		

Table 4.16. Test statistics based on Chi-square goodness-of-fit test on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (pharmacists).

Chi-Square	**11.800[b]**
df	3
p value	**<0.01**

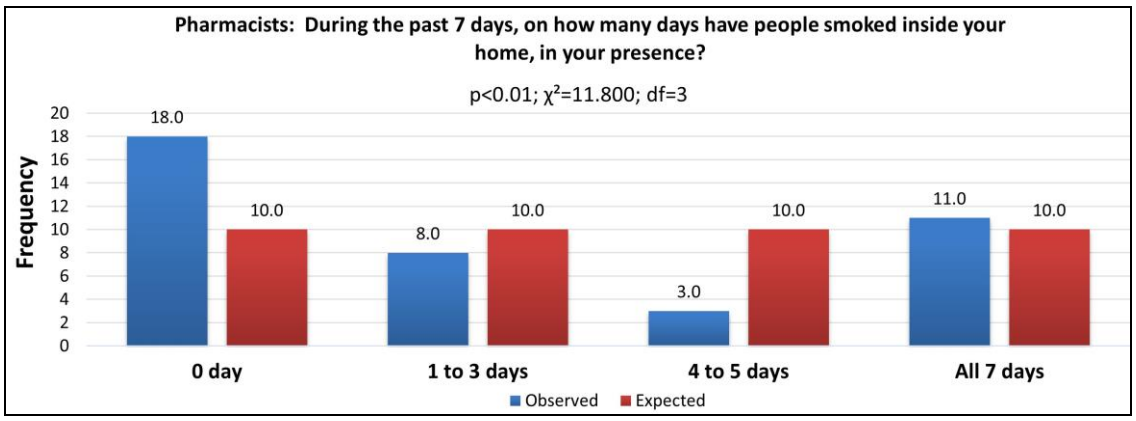

Figure 4.11. Bar diagram showing the observed and expected frequencies on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (pharmacists) (n=40).

Table 4.17. The observed, expected and residual frequencies on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (MPHW).

	Observed	Expected	Residual
0 day	35	17.6	17.4
1 to 2 days	17	17.6	-.6
3 to 4 days	9	17.6	-8.6
5 to 6 days	3	17.6	-14.6
All 7 days	24	17.6	6.4
Total	88		

Table 4.18. Test statistics based on Chi-square goodness-of-fit test on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (MPHW).

Chi-Square	**35.864[b]**
df	4
p value	**<0.001**

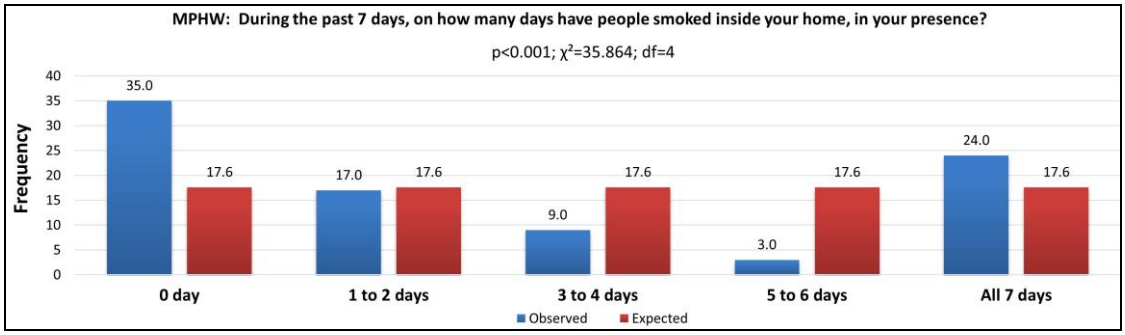

Figure 4.12. Bar diagram showing the observed and expected frequencies on how many days people have smoked inside the participant's home, in his/her presence during the past 7 days (MPHW) (n=88).

Table 4.19. The observed, expected and residual frequencies on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (doctors).

	Observed	Expected	Residual
0 day	13	9.0	4.0
1 to 2 days	15	9.0	6.0
3 to 4 days	12	9.0	3.0
5 to 6 days	1	9.0	-8.0
All 7 days	4	9.0	-5.0
Total	45		

Table 4.20. Test statistics based on Chi-square goodness-of-fit test on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (doctors).

Chi-Square	**16.667[b]**
df	4
p value	**<0.01**

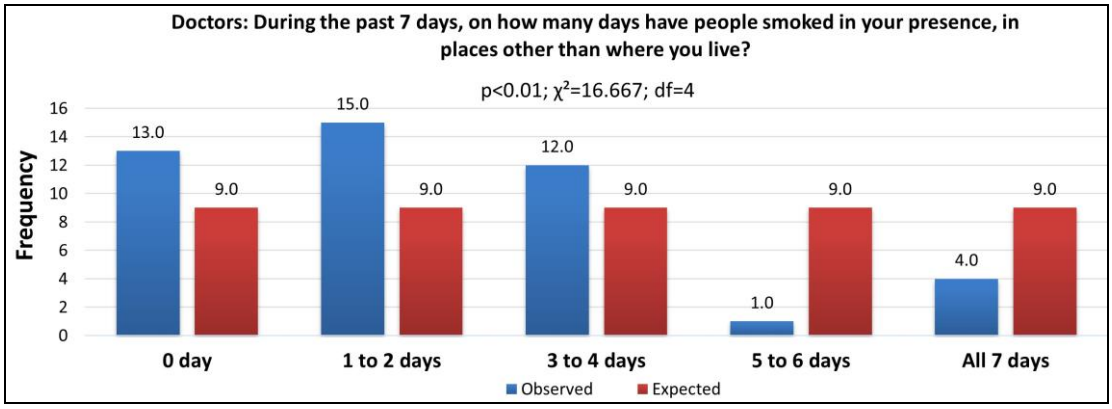

Figure 4.13. Bar diagram showing the observed and expected frequencies on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (doctors) (n=45).

Table 4.21. The observed, expected and residual frequencies on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (dentists).

	Observed	Expected	Residual
0 day	4	4.3	-.3
1 to 3 days	8	4.3	3.8
4 to 5 days	3	4.3	-1.3
All 7 days	2	4.3	-2.3
Total	17		

Table 4.22. Test statistics based on Chi-square goodness-of-fit test on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (dentists).

Chi-Square	**4.882[b]**
df	3
p value	0.181

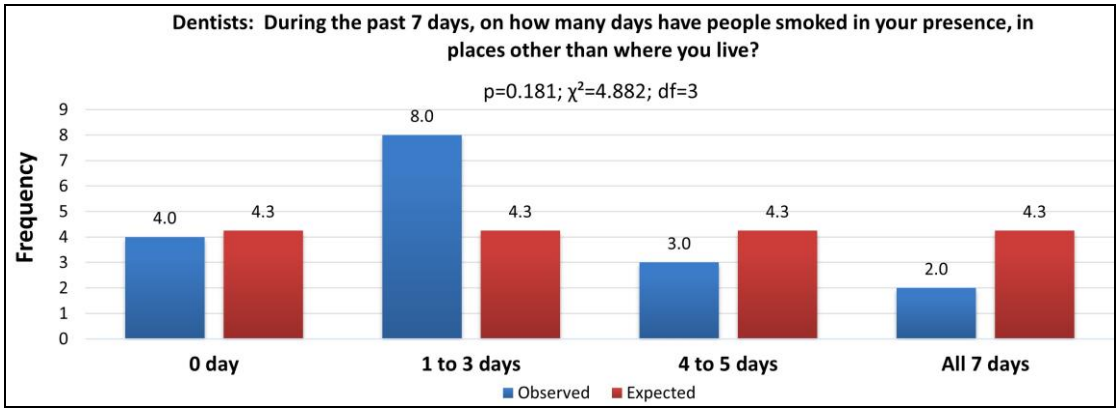

Figure 4.14. Bar diagram showing the observed and expected frequencies on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (dentists) (n=17).

Table 4.23. The observed, expected and residual frequencies on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (nurses).

	Observed	Expected	Residual
0 day	83	47.2	35.8
1 to 2 days	85	47.2	37.8
3 to 4 days	36	47.2	-11.2
5 to 6 days	13	47.2	-34.2
All 7 days	19	47.2	-28.2
Total	236		

Table 4.24. Test statistics based on Chi-square goodness-of-fit test on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (nurses).

Chi-Square	101.712[b]
df	4
p value	**<0.001**

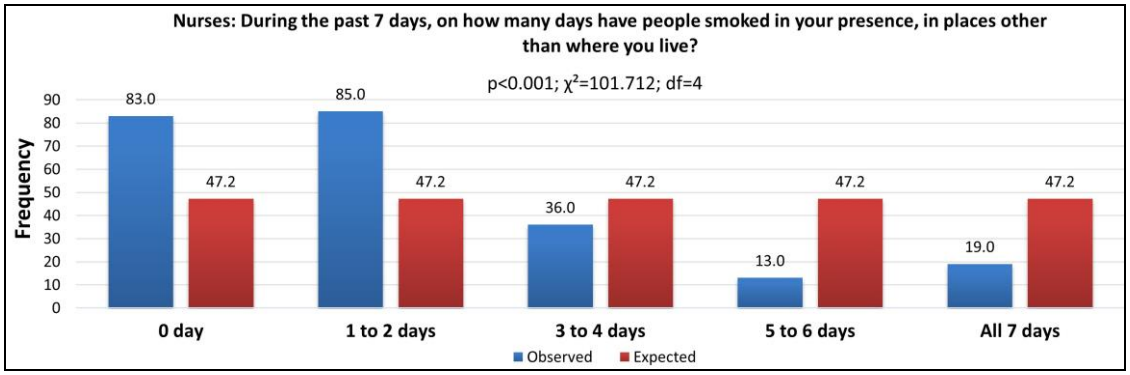

Figure 4.15. Bar diagram showing the observed and expected frequencies on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (nurses) (n=236).

Table 4.25. The observed, expected and residual frequencies on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (pharmacists).

	Observed	Expected	Residual
0 day	6	8.0	-2.0
1 to 2 days	17	8.0	9.0
3 to 4 days	5	8.0	-3.0
5 to 6 days	2	8.0	-6.0
All 7 days	10	8.0	2.0
Total	40		

Table 4.26. Test statistics based on Chi-square goodness-of-fit test on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (pharmacists).

Chi-Square	16.750[c]
df	4
p value	**<0.01**

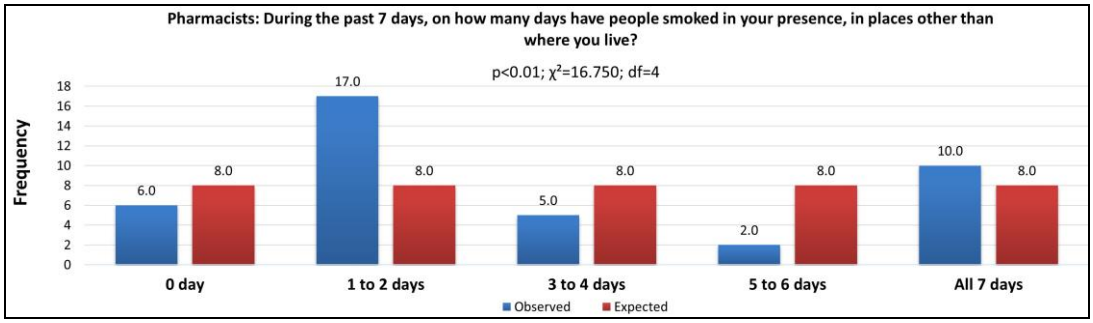

Figure 4.16. Bar diagram showing the observed and expected frequencies on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (pharmacists) (n=40).

Table 4.27. The observed, expected and residual frequencies on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (MPHW).

	Observed	Expected	Residual
0 day	22	17.6	4.4
1 to 2 days	19	17.6	1.4
3 to 4 days	18	17.6	.4
5 to 6 days	4	17.6	-13.6
All 7 days	25	17.6	7.4
Total	88		

Table 4.28. Test statistics based on Chi-square goodness-of-fit test on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (MPHW).

Chi-Square	14.841[b]
df	4
p value	**<0.01**

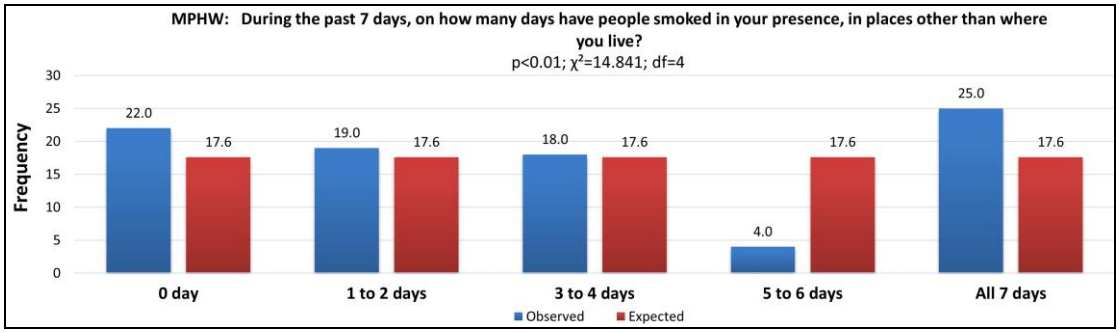

Figure 4.17. Bar diagram showing the observed and expected frequencies on how many days people have smoked in the participant's presence, in places other than where he/she lives during the past 7 days (MPHW) (n=88).

Table 4.29. The observed, expected and residual frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (doctors).

	Observed	Expected	Residual
No	4	22.5	-18.5
Yes	41	22.5	18.5
Total	45		

Table 4.30. Test statistics based on Chi-square goodness-of-fit test on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (doctors).

Chi-Square	**30.422[c]**
Df	1
p value	**<0.001**

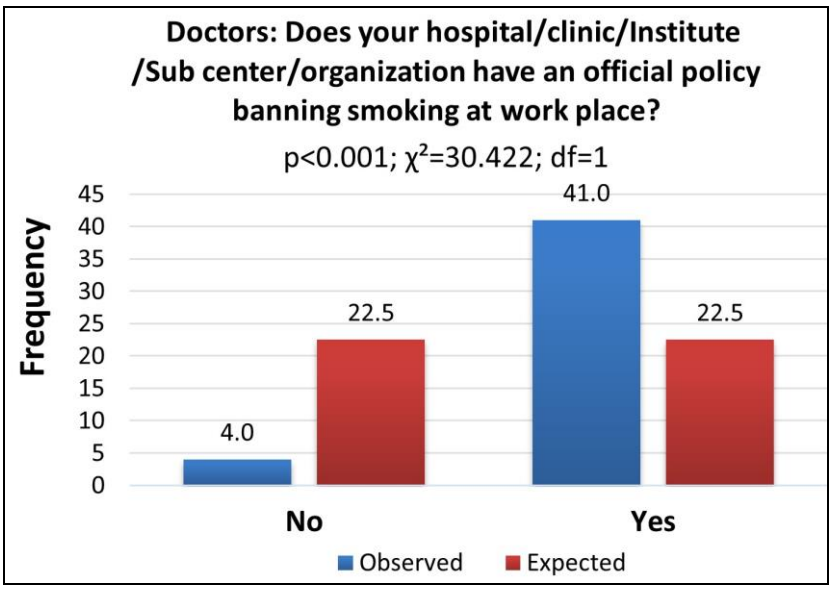

Figure 4.18. Bar diagram showing the observed and expected frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (doctors) (n=45).

Table 4.31. The observed, expected and residual frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (dentists).

	Observed	Expected	Residual
No	3	8.5	-5.5
Yes	14	8.5	5.5
Total	17		

Table 4.32. Test statistics based on Chi-square goodness-of-fit test on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (dentists).

Chi-Square	**7.118[c]**
df	1
p value	**<0.01**

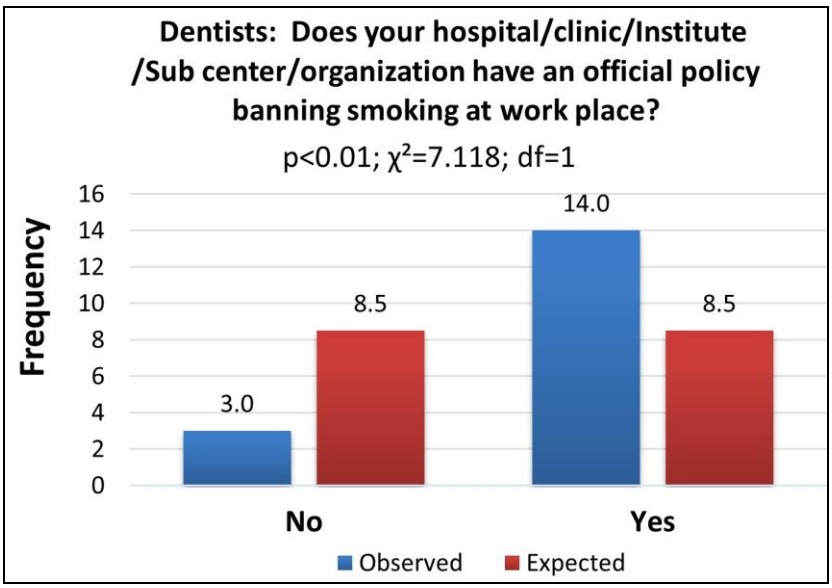

Figure 4.19. Bar diagram showing the observed and expected frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (dentists) (n=17).

Table 4.33. The observed, expected and residual frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (nurses).

	Observed	Expected	Residual
No	30	118.0	-88.0
Yes	206	118.0	88.0
Total	236		

Table 4.34. Test statistics based on Chi-square goodness-of-fit test on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (nurses).

Chi-Square	131.254[c]
df	1
p value	**<0.001**

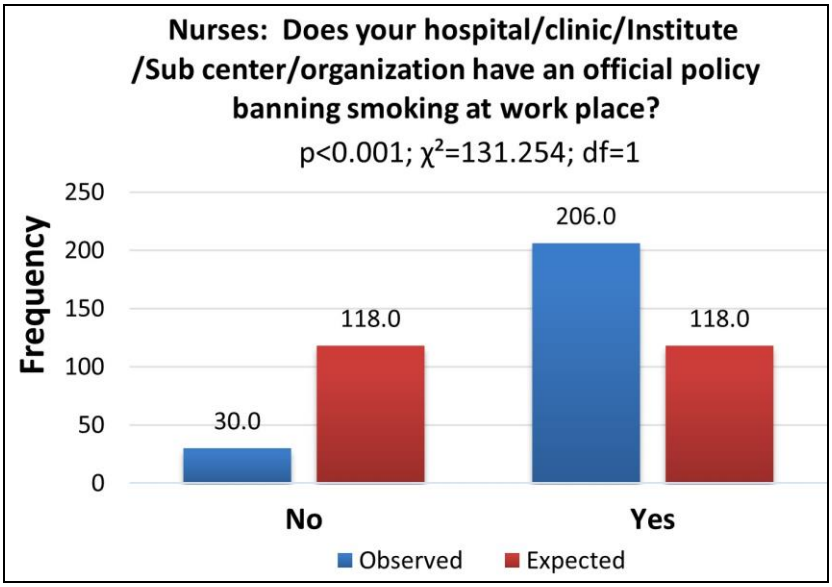

Figure 4.20. Bar diagram showing the observed and expected frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (nurses) (n=236).

Table 4.35. The observed, expected and residual frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (pharmacists).

	Observed	Expected	Residual
No	7	20.0	-13.0
Yes	33	20.0	13.0
Total	40		

Table. 4.36. Test statistics based on Chi-square goodness-of-fit test on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (pharmacists).

Chi-Square	**16.900[d]**
df	1
p value	**<0.001**

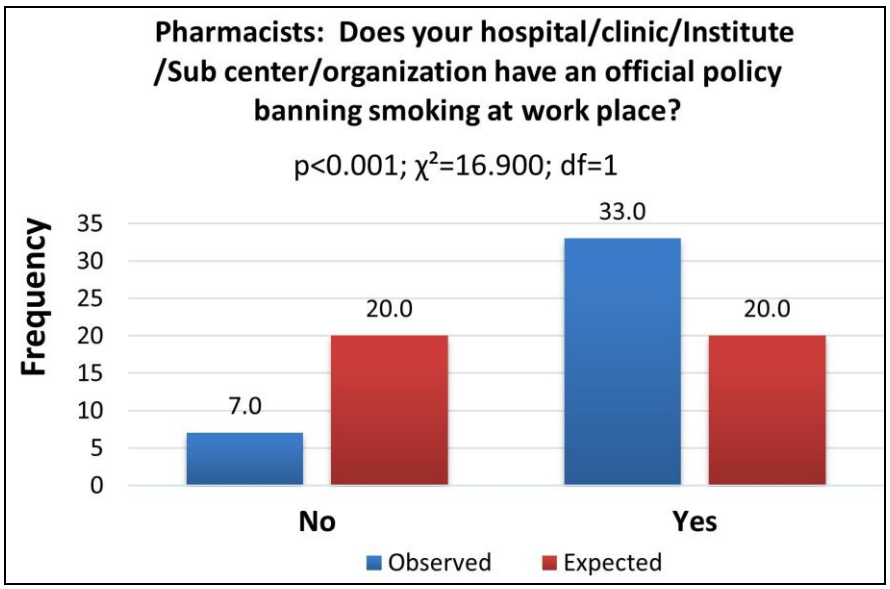

Figure 4.21. Bar diagram showing the observed and expected frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (pharmacists) (n=40).

Table 4.37. The observed, expected and residual frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (MPHW).

	Observed	Expected	Residual
No	21	44.0	-23.0
Yes	67	44.0	23.0
Total	88		

Table 4.38. Test statistics based on Chi-square goodness-of-fit test on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (MPHW).

Chi-Square	**24.045[c]**
df	1
p value	**<0.001**

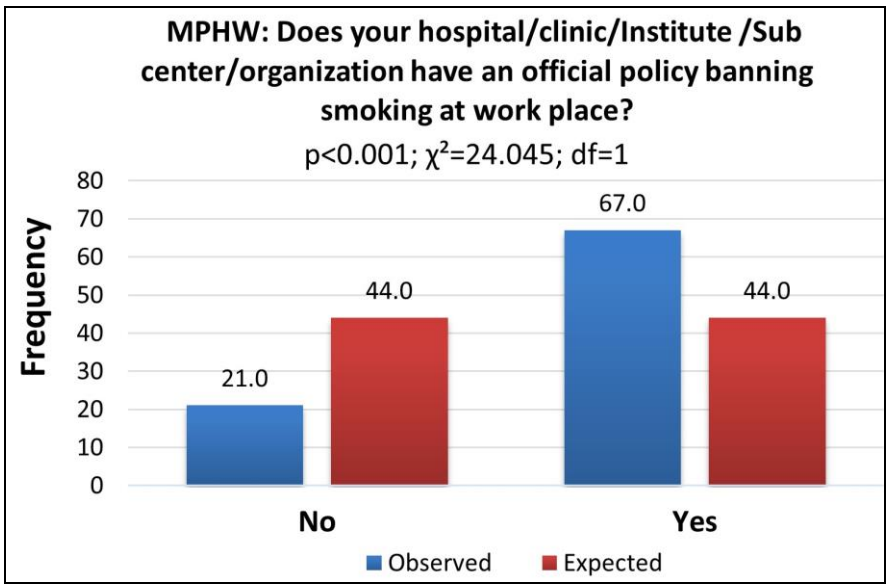

Figure 4.22. Bar diagram showing the observed and expected frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place (MPHW) (n=88).

Table 4.39. The observed, expected and residual frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (doctors).

	Observed	Expected	Residual
No official policy	4	15.0	-11.0
Yes	34	15.0	19.0
No	7	15.0	-8.0
Total	45		

Table 4.40. Test statistics based on Chi-square goodness-of-fit test on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (doctors).

Chi-Square	**36.400[d]**
Df	2
p value	**<0.001**

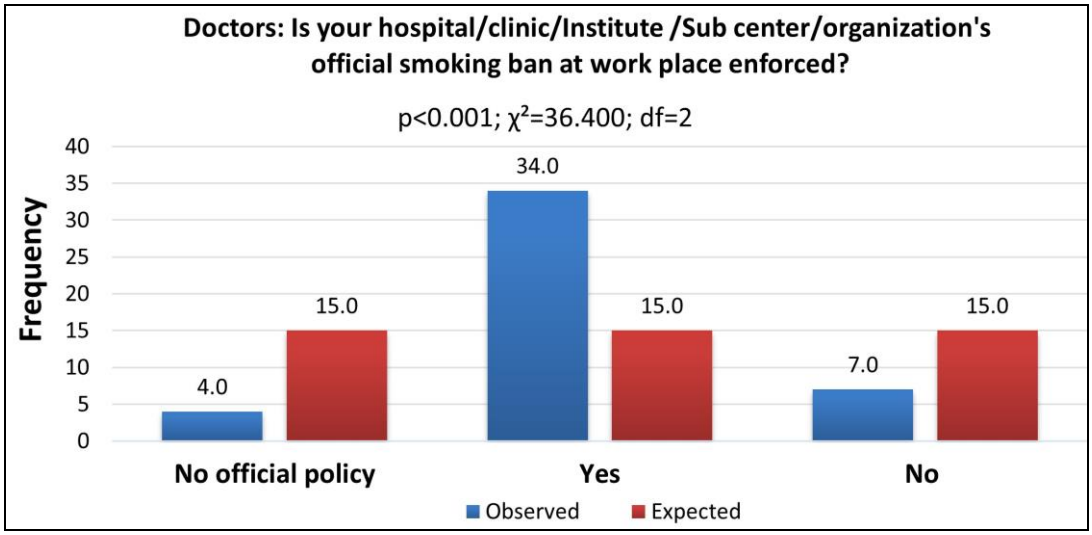

Figure 4.23. Bar diagram showing the observed and expected frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (doctors) (n=45).

Table 4.41. The observed, expected and residual frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (dentists).

	Observed	Expected	Residual
Yes	14	8.5	5.5
No	3	8.5	-5.5
Total	17		

Table 4.42. Test statistics based on Chi-square goodness-of-fit test on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (dentists).

Chi-Square	**7.118[c]**
df	1
p value	**<0.01**

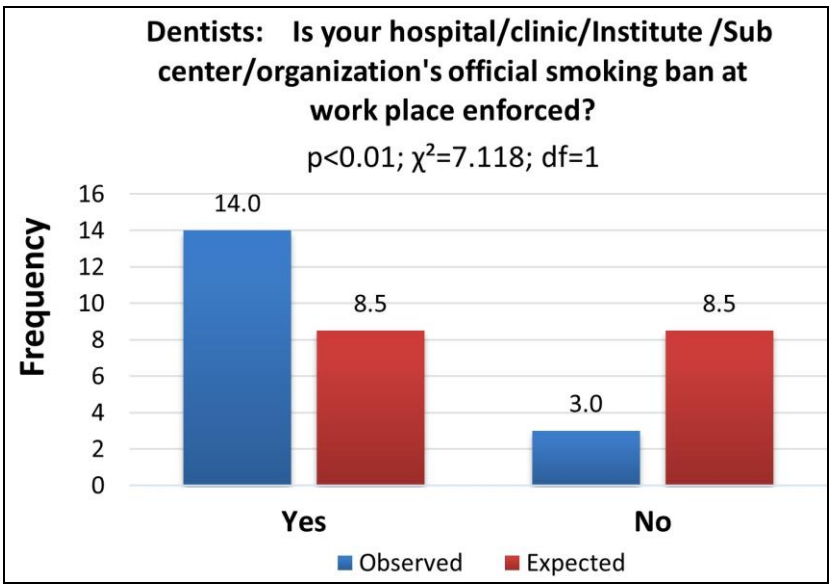

Figure 4.24. Bar diagram showing the observed and expected frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (dentists) (n=17).

Table 4.43. The observed, expected and residual frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (nurses).

	Observed	Expected	Residual
No official policy	22	78.7	-56.7
Yes	199	78.7	120.3
No	15	78.7	-63.7
Total	236		

Table 4.44. Test statistics based on Chi-square goodness-of-fit test on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (nurses).

Chi-Square	**276.415[d]**
df	2
p value	**<0.001**

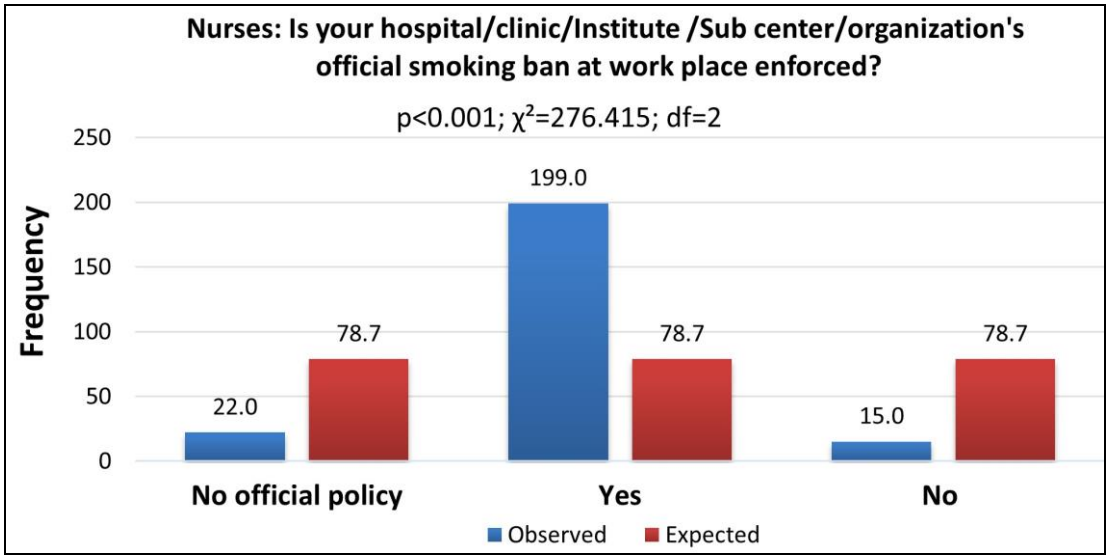

Figure 4.25. Bar diagram showing the observed and expected frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (nurses) (n=236).

Table 4.45. The observed, expected and residual frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (pharmacists).

	Observed	Expected	Residual
No official policy	5	13.3	-8.3
Yes	29	13.3	15.7
No	6	13.3	-7.3
Total	40		

Table 4.46. Test statistics based on Chi-square goodness-of-fit test on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (pharmacists).

Chi-Square	**27.650[e]**
df	2
p value	**<0.001**

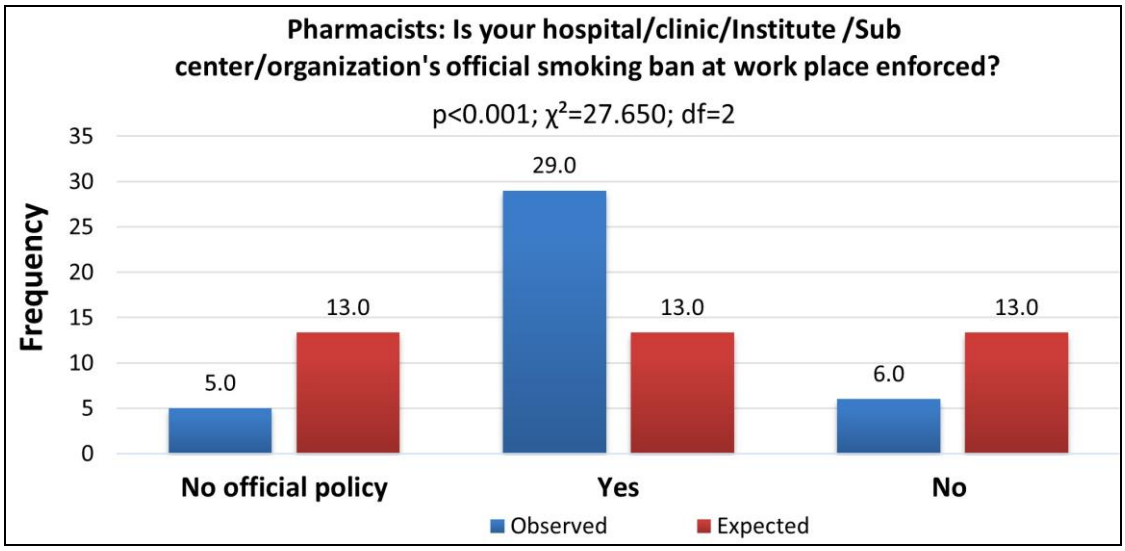

Figure 4.26. Bar diagram showing the observed and expected frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (pharmacists) (n=40).

Table 4.47. The observed, expected and residual frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (MPHW).

	Observed	Expected	Residual
No official policy	15	29.3	-14.3
Yes	65	29.3	35.7
No	8	29.3	-21.3
Total	88		

Table 4.48. Test statistics based on Chi-square goodness-of-fit test on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (MPHW).

Chi-Square	**65.886[d]**
df	2
p value	**<0.001**

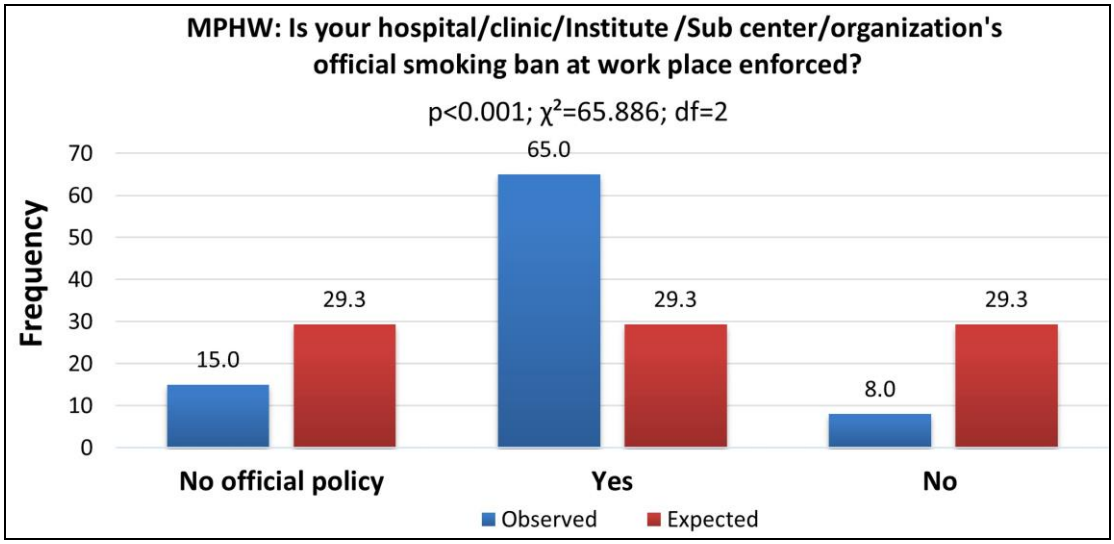

Figure 4.27. Bar diagram showing the observed and expected frequencies on whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced (MPHW) (n=88).

The difference on the mean rank for exposure to environmental tobacco smoke among different professions under studied is 193.36 (nurses) to 256.89 (MPHW), and comparison on the mean rank differences using Kruskal Wallis test is statistically significant (p<0.001) (Table 4.49, 4.50; Fig. 4.28).

Table 4.49. The observed and mean rank on exposure to environmental tobacco smoke among different professions under studied.

Profession	Observed	Mean Rank
Doctors	45	208.92
Dentists	17	198.03
Nurses	236	193.36
Pharmacists	40	248.63
MPHW	88	256.89
Total	426	

Table 4.50. Test statistics based on Kruskal-Wallis's test to compare the mean rank on exposure to environmental tobacco smoke among different professions under studied.

Chi-Square	**21.287**
Df	4
p value	**<0.001**

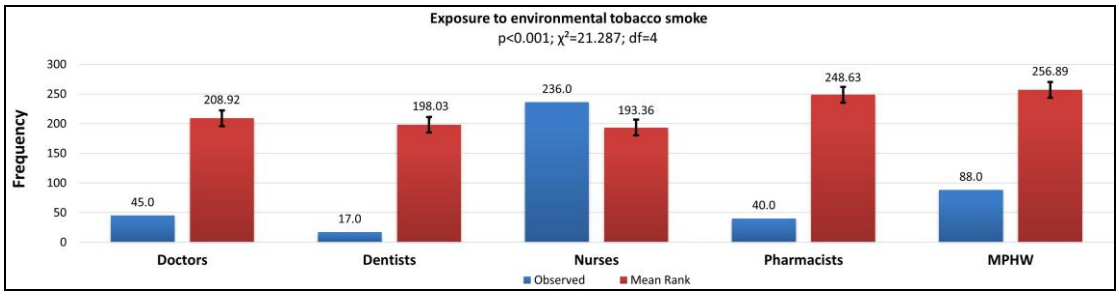

Figure 4.28. Bar diagram showing the observed and mean rank (with standard error) on exposure to environmental tobacco smoke among different professions under studied (n=426).

4.6: Cessation of tobacco use among the healthcare professionals under study.

The cessation of tobacco use was assessed and analyzed by pooling the five different professions using chi-square test. In this test, observed and expected frequencies are tested whether there is association between cessation with respect to healthcare professionals, and whether the difference in frequency distribution is statistically significant. The frequency distributions were compared on the following parameters and were found statistically significant as mentioned in parentheses:

a) Among previous users of smoking tobacco with regardless of profession (n=74), differences in the frequency on participants who were past-smokers and stopped smoking regarding how long ago have they stop smoking cigarettes is statistically significant ($p<0.001$) where the observed frequency is lowest (6) for those who have stopped smoking for 2 years, and those who have stopped for 3 years or more is highest (34) (Table 4.51, 4.52; Fig. 4.29).

b) Among previous and current users of smoking tobacco with regardless of profession (n=130), differences in the frequency on whether the participant have ever received help or advice to help you stop smoking cigarettes is statistically significant ($p<0.001$) where the observed frequency is lower (41) for those who received help or advise, and highest (89) for those who did not receive any help or advise to help stop smoking (Table 4.53, 4.54; Fig. 4.30).

Table 4.51. The observed, expected and residual frequencies on participants who were past-smokers and stopped smoking regarding how long ago have they stop smoking cigarettes (previous users of smoking tobacco with regardless of profession).

	Observed	Expected	Residual
<1 month	10	12.3	-2.3
1 to 5 months	8	12.3	-4.3
6 to 11 months	7	12.3	-5.3
1 year	9	12.3	-3.3
2 years	6	12.3	-6.3
3 years or longer	34	12.3	21.7
Total	74		

Table 4.52. Test statistics based on Chi-square goodness-of-fit test on participants who were past-smokers and stopped smoking regarding how long ago have they stop smoking cigarettes (previous users of smoking tobacco with regardless of profession).

Chi-Square	**46.486[a]**
df	5
p value	**<0.001**

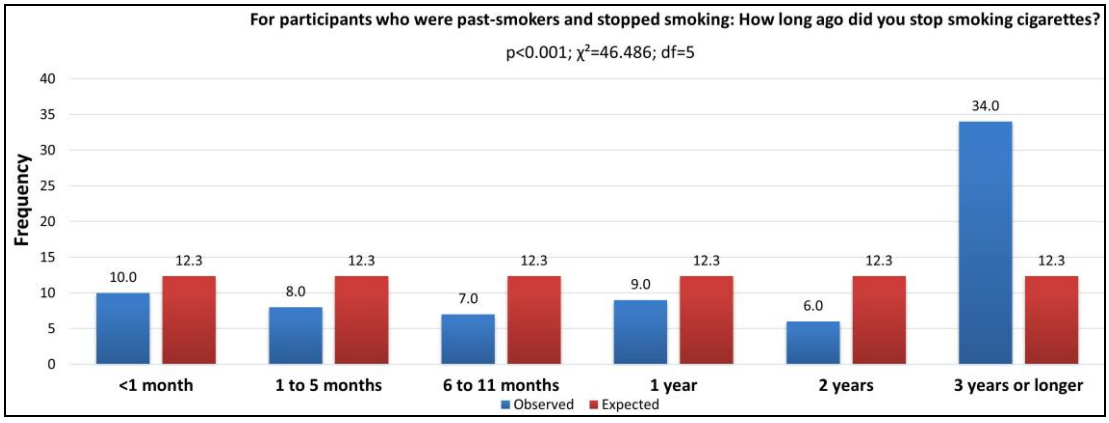

Figure 4.29. Bar diagram showing the observed and expected frequencies on participants who were past-smokers and stopped smoking regarding how long ago have they stop smoking cigarettes (previous users of smoking tobacco with regardless of profession) (n=74).

Table 4.53. The observed, expected and residual frequencies on whether the participant have ever received help or advice to help them stop smoking cigarettes (previous and current users of smoking tobacco with regardless of profession).

	Observed	Expected	Residual
Yes	41	65.0	-24.0
No	89	65.0	24.0
Total	130		

Table 4.54. Test statistics based on Chi-square goodness-of-fit test on whether the participant have ever received help or advice to help them stop smoking cigarettes (previous and current users of smoking tobacco with regardless of profession).

Chi-Square	**17.723**
Df	1
p value	**<0.001**

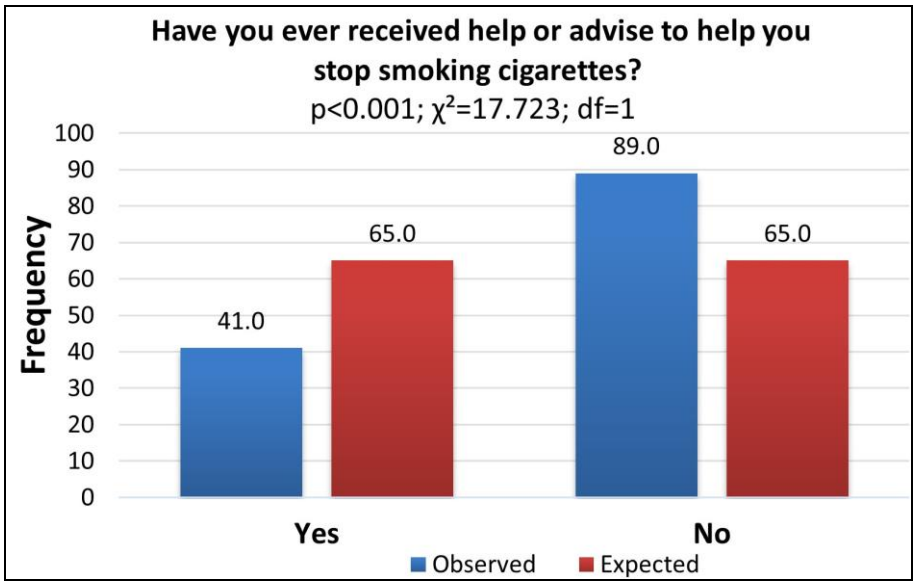

Figure 4.30. Bar diagram showing the observed and expected frequencies on whether the participant have ever received help or advice to help you stop smoking cigarettes (previous and current users of smoking tobacco with regardless of profession) (n=130).

The difference on the mean rank scored for tobacco use cessation among different professions (n=426) under studied is 164.10 (pharmacists) to 240.21 (nurses), and comparison on the mean rank differences using Kruskal Wallis test is statistically significant (p<0.001) (Table 4.55, 4.56; Fig. 4.31).

Table 4.55. The observed and mean rank on tobacco use cessation among different professions under studied.

Profession	Observed	Mean Rank
Doctors	45	186.60
Dentists	17	229.91
Nurses	236	240.21
Pharmacists	40	164.10
MPHW	88	174.90
Total	426	

Table 4.56. Test statistics based on Kruskal-Wallis's test to compare the mean rank on tobacco use cessation among different professions under studied.

Chi-Square	**30.863**
Df	4
p value	**<0.001**

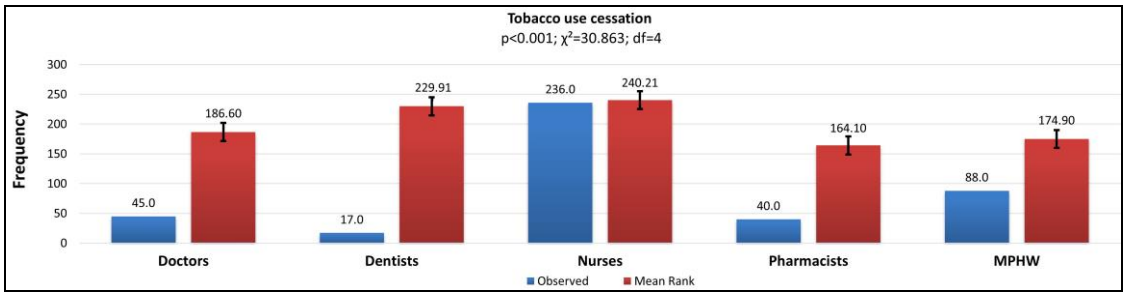

Figure 4.31. Bar diagram showing the observed and mean rank (with standard error) on tobacco use cessation among different professions under studied (n=426).

4.7: Previous training attended by healthcare professionals regarding tobacco.

Training attended by healthcare professionals towards tobacco use was assessed (Table 4.57), and found that the mean rank on training towards tobacco use is highest in nurses (224.85) and lowest in pharmacists (159.0). However, upon testing using Kruskal Wallis test, the comparison on the mean rank across different professions is statistically significant ($p<0.01$) (Table 4.58, 4.59; Fig. 4.32).

Table 4.57: Participants' responses regarding training on tobacco during their course of study for becoming a healthcare professional (n-number of participants; %-percentage). Higher (reddish) and lower (bluish) values are presented in heatmap.

Questions	All N=426 (%)	Doctors n=45	Dentists n=17	Nurses n=236	Pharmacists n=40	MHW n=88
During your (medical, dental, nursing, pharmacy, health worker) school training, were you taught in any of your classes about the dangers of smoking/using smokeless tobacco?	407 (95.5)	42 (93.3)	16 (94.1)	229 (97.0)	36 (90.0)	84 (95.5)
During your (medical, dental, nursing, pharmacy, health worker) school training, did you discuss in any of your classes the reasons why people smoke/use smokeless tobacco?	350 (82.2)	30 (66.7)	15 (88.2)	204 (86.4)	26 (65.0)	75 (85.2)
During your (medical, dental, nursing, pharmacy, health worker) school training, did you learn that it is important to record tobacco use history as a part of patients' general history?	394 (92.5)	45 (100)	17 (100)	224 (94.9)	28 (70.0)	80 (90.9)
During your (medical, dental, nursing, pharmacy, health worker) school training, have you ever received any formal training in tobacco cessation approaches to use with patients?	289 (67.8)	18 (40.0)	11 (64.7)	172 (72.9)	19 (47.5)	69 (78.4)
During your (medical, dental, nursing, pharmacy, health worker) school training, did you learn that it is important to provide educational materials to support tobacco cessation to patients who want to quit smoking/ smokeless tobacco use?	355 (83.3)	34 (75.6)	14 (82.4)	209 (88.6)	22 (55.0)	76 (86.4)
Have you ever heard of using nicotine replacement therapies in tobacco cessation programs (such as nicotine patches or gum)?	379 (89.0)	44 (97.8)	17 (100)	216 (91.5)	35 (87.5)	67 (76.1)
Have you ever heard of using antidepressants in tobacco cessation programs (such as bupropion or Zyban)?	161 (37.8)	21 (46.7)	3 (17.6)	85 (36.0)	15 (37.5)	37 (42.0)

Table 4.58. The observed and mean rank on curriculum/training on tobacco among different professions under studied.

Profession	Observed	Mean Rank
Doctors	45	189.50
Dentists	17	195.62
Nurses	236	224.85
Pharmacists	40	159.04
MPHW	88	223.55
Total	426	

Table 4.59. Test statistics based on Kruskal-Wallis's test to compare the mean rank on curriculum/training on tobacco among different professions under studied.

Chi-Square	**13.423**
Df	4
p value	**<0.01**

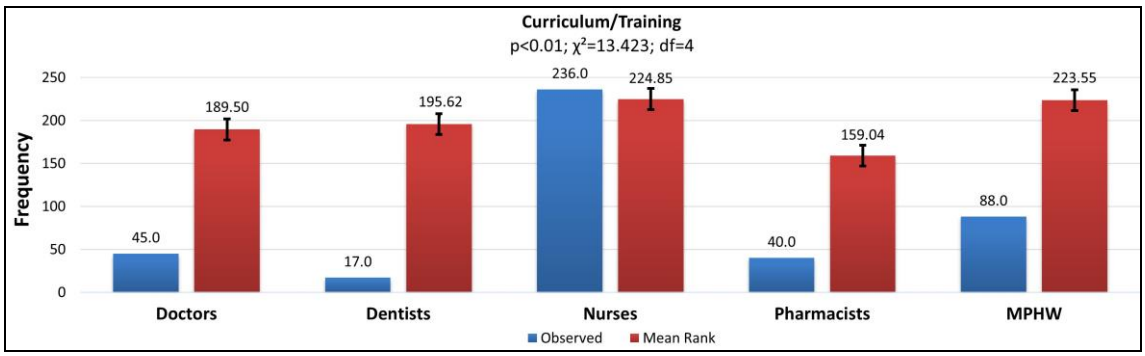

Figure 4.32. Bar diagram showing the observed and mean rank (with standard error) on curriculum/training on tobacco among different professions under studied (n=426).

4.8: Level of attitude of healthcare professionals toward tobacco use.

The attitude towards tobacco use was assessed (Table 4.60), and found that the mean rank on attitude towards tobacco use is highest in dentists (278.0) and lowest in doctors (197.97). However, upon testing using Kruskal Wallis test, the comparison on the mean rank across different professions is not statistically significant (p>0.05) (Table 4.61, 4.62; Fig. 4.33).

Table 4.60: Observation of the level of attitude of healthcare professionals under studied towards tobacco use (n=426) (n-number of participants; %-percentage). Higher (reddish) and lower (bluish) values are presented in heatmap. (n=426)

Statements	Strongly agree		Agree		Undecided		Disagree		Strongly disagree	
	n	%	N	%	n	%	N	%	n	%
Smoking is harmful to health	391	91.8	34	8	0	0	1	0.2	0	0
Second-hand smoke is harmful to health	355	83.3	70	16.4	0	0	1	0.2	0	0
Smokeless tobacco use is harmful to health	319	74.9	94	22	8	1.9	2	0.5	3	0.7
Smoking ban act is fair to the non-smokers	281	66	123	28.9	18	42	4	0.9	0	0
The smoking ban act is fair to the smokers	198	46.5	157	36.9	62	14.6	9	2.1	0	0
Tobacco sales to adolescents should be banned	285	66.9	112	26.3	23	5.4	5	1.2	1	0.2
Policies on cessation of smoking should be implemented in the healthcare setting	304	71.4	116	27.2	6	1.4	0	0	0	0
One should be cautious about smoking in the presence of non-smokers	328	77	94	22.1	4	0.9	0	0	0	0
One should be cautious about the use of smokeless tobacco in the presence of non-users	259	60.8	136	31.9	27	6.3	4	0.9	0	0
Healthcare professionals should not smoke in the presence of children	351	82.4	74	17.4	1	0.2	0	0	0	0
Healthcare professionals should not practice the use of smokeless tobacco in the presence of children	318	74.6	97	22.8	11	2.6	0	0	0	0
It is the responsibility of Health care professionals to warn the smokers of the harmful effects of smoking	307	72.1	117	27.5	2	0.5	0	0	0	0
It is the responsibility of healthcare professionals to warn the smokeless tobacco user of the harmful effects of tobacco use.	298	70	123	28.9	4	0.9	1	0.2	0	0
It is the responsibility of healthcare professionals to warn pregnant women the harmful effects smoking has on the foetus	353	82.9	71	16.7	2	0.5	0	0	0	0
It is the responsibility of healthcare professionals to warn pregnant women the harmful effects of smokeless tobacco on the foetus	336	78.9	83	19.5	7	1.6	0	0	0	0

Healthcare professionals are "role models for their patients and public	301	70.7	113	26.5	9	2.1	3	0.7	0	0
Health care professionals should routinely advise patients to stop smoking	265	62.2	143	33.6	16	3.8	2	0.5	0	0
Healthcare professionals should routinely advise patients to stop using smokeless tobacco products.	255	59.9	154	36.2	14	3.3	3	0.7	0	0
Healthcare professionals have a greater responsibility toward the harmful effects of tobacco use	260	61	148	34.7	14	3.3	4	0.9	0	0
Healthcare professionals should attend specific training on tobacco cessation techniques	252	59.2	165	38.7	8	1.9	1	0.2	0	0
Healthcare organizations should establish tobacco cessation clinic	254	59.6	156	36.6	16	3.8	0	0	0	0
The chances of patients quitting tobacco use increase if a healthcare professional advises him/her	198	46.5	193	45.3	29	6.8	5	1.2	1	0.2
Health care professionals who are themselves smokers are less likely to advise patients to stop smoking	176	41.3	198	46.5	31	7.3	18	4.2	3	0.7
Healthcare professionals who themselves use smokeless tobacco are less likely to advise patients to stop using smokeless tobacco products.	171	40.1	196	46	35	8.2	21	4.9	3	0.7
Kruskal Wallis Test on attitude towards tobacco usage across professions.	p=0.169; χ^2=6.438; df=4									

Table 4.61. The observed and mean rank on attitude towards tobacco among different professions under studied.

Profession	Observed	Mean Rank
Doctors	45	197.97
Dentists	17	278.00
Nurses	236	217.10
Pharmacists	40	205.94
MPHW	88	202.78
Total	426	

Table 4.62. Test statistics based on Kruskal-Wallis's test to compare the mean rank on attitude towards tobacco among different professions under studied.

Chi-Square	**6.438**
df	4
p value	0.169

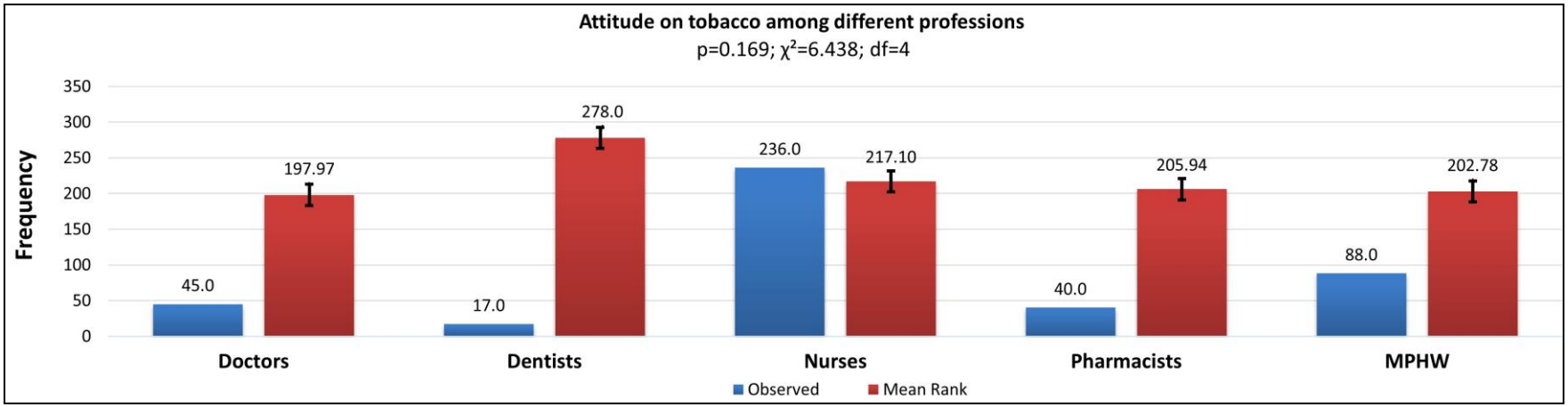

Figure 4.33. Bar diagram showing the observed and mean rank (with standard error) on attitude towards tobacco among different professions under studied (n=426).

4.9: The relationship between the prevalence of tobacco use and attitudes, association between prevalence of tobacco use and socio-demographic characteristics, and association between attitude and their socio-demographic characteristics.

In this section, the non-parametric multivariate Correspondence Analysis was implemented to determine the association between prevalence of tobacco use and attitudes towards tobacco use (Table 4.63), and between socio-demographic characteristics and attitudes (Table 4.64). On the other hand, association between prevalence of tobacco use and socio-demographic characteristics are tested using Pearson's Chi-square statistics alone (Table 4.65).

Between prevalence of tobacco use and attitudes towards tobacco use, it was determined that the forms of tobacco use are having a statistically significant association with attitudes ($p<0.001$); the group who do not use tobacco in any form contributes 33.1% (inertia value=0.331) of the chi-square statistics and has stronger association with attitudes compared to smoking, smokeless and user of both groups. How old the participants were when they first tried cigarette smoking is having a statistically significant association with attitudes ($p<0.001$); participant >30 years contributes 52.7% (inertia value=0.527) of the chi-square statistics and has stronger association with attitudes compared to other age groups. Among present smokers, how many days cigarettes was smoked during the past 30 days is having a statistically significant association with attitudes ($p<0.001$); participant who did not smoke at all during this time period contributes 42.9% (inertia value=0.429) of the chi-square statistics and has stronger association with attitudes compared to other groups. Likewise, among present users of smokeless tobacco, how many days was smokeless tobacco was used during the past 30 days is having a statistically significant association with attitudes ($p<0.001$); participant who used smokeless tobacco 1-2 days during this time period contributes 35.2% (inertia value=0.352) of the chi-square statistics and has stronger association with attitudes compared to other groups.

Therefore, the null hypothesis H_0 is rejected and accepted the alternative hypothesis H_1 stating that there is a significant relationship between the prevalence of tobacco use and attitude among healthcare professionals.

Between socio-demographic characteristics and attitudes towards tobacco use, it was also determined that age group is having a statistically significant association with attitudes ($p<0.001$); the age group of 30-39 contributes 94.3% (inertia value=0.943) of the chi-square statistics and has stronger association with attitudes compared to other age groups. Gender is having a statistically significant association with attitudes ($p<0.001$); male contributes 82.4% (inertia value=0.824) of the chi-square statistics and has stronger association with attitudes compared to female. Religion is inferred to be having a statistically significant association with attitudes ($p<0.001$); religious group "Others" contributes 98.9% (inertia value=0.989) of the chi-square statistics and has stronger association with attitudes compared to the other studied religious groups i.e. Christian and Hindu. Marital status is having a statistically significant association with attitudes ($p<0.001$); divorced participants contribute 77.6% (inertia value=0.776) of the chi-square statistics and has stronger association with attitudes compared to other marital status groups like single, married and widowed. Family type is having a statistically significant association with attitudes ($p<0.001$); although the three family types categorized in this study contributes almost uniformly, but nuclear family contributes 35.4% (inertia value=0.354) of the chi-square statistics and has stronger association with attitudes compared to other family types. Food habit is also having a statistically significant association with attitudes ($p<0.001$); vegan contributes 76.9% (inertia value=0.769) of the chi-square statistics and has stronger association with attitudes compared to non-vegetarians and vegetarians. The five different health care professions studied is also having a statistically significant association with attitudes ($p<0.001$); doctors contribute 55.3% (inertia value=0.553) of the chi-square statistics and has stronger association with attitudes compared to other professions.

Therefore, the null hypothesis H_0 is rejected and accepted the alternative hypothesis H_2 stating that there is a significant association between attitudes toward

tobacco use among healthcare professionals and their selected demographic variables.

Between prevalence of tobacco use and socio-demographic characteristics, statistically significant associations are inferred across the following characteristics: age group is having an association with the forms of tobacco use ($p<0.001$), how old the participant was when cigarette was tried for the first time ($p<0.01$), how many days the participant used smokeless tobacco in the past 30 days ($p<0.001$), whether smokeless tobacco was used in hospital/Clinic/Institute/Sub canter's premises during the past year ($p<0.001$); gender is having an association with the forms of tobacco use ($p<0.001$), whether the participant ever tried or experimented with cigarette smoking even one or two puffs ($p<0.01$), how old the participant was when cigarette was tried for the first time ($p<0.001$), how many days the participant smoked cigarettes in the past 30 days ($p<0.001$); gender and whether the participant smoked cigarettes in hospital/Clinic/Institute/Sub canter's premises during the past year ($p<0.001$); religion is having an association with how many days the participant smoked cigarettes in the past 30 days ($p<0.01$), and whether the participant ever used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) ($p<0.05$); marital status is having an association with with the forms of tobacco use ($p<0.001$), whether the participant ever used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) ($p<0.05$), how many days the participant used smokeless tobacco in the past 30 days ($p<0.01$), and whether the participant used smokeless tobacco in hospital/Clinic/Institute/Sub canter's premises during the past year ($p<0.001$); food habit is having associations with how many days the participant smoked cigarettes ($p<0.01$) and used smokeless tobacco ($p<0.05$) in the past 30 days; profession is having associations with the forms of tobacco use ($p<0.001$), whether the participant ever tried or experimented with cigarette smoking even one or two puffs ($p<0.01$), how old the participant was when cigarette was tried for the first time ($p<0.05$), how many days the participant smoked cigarettes in the past 30 days ($p<0.001$), and whether the participant smoked cigarettes in hospital/Clinic/Institute/Sub canter's premises during the past year ($p<0.001$); work experience is having associations with the forms of tobacco use

($p<0.01$), how many days the participant smoked cigarettes in the past 30 days ($p<0.05$), and whether the participant smoked cigarettes in hospital/Clinic/Institute/Sub canter's premises during the past year ($p<0.01$); organization is having associations with how many days the participant smoked cigarettes in the past 30 days ($p<0.01$), how many days the participant used smokeless tobacco in the past 30 days ($p<0.05$), whether smokeless tobacco was used in hospital/Clinic/Institute/Sub canter's premises during the past year ($p<0.05$).

Therefore, the null hypothesis H_0 is rejected and accepted the alternative hypothesis H_3 stating that there is a significant association between tobacco use prevalence among healthcare professionals and their selected demographic variables.

Table 4.63. Correspondence Analysis on the frequency distribution to test the association between tobacco use prevalence and attitude towards tobacco use among health care professionals. The p values for statistically significant inferences are indicated in bold, and the inertia values for the variable contributing highest to the corresponding association are also indicated in bold in statistically significant inferences.(n=426)

Tobacco use Prevalence		Tobacco use Prevalence Frequency	Attitude Score Frequency					Correspondence Analysis	
			Strongly disagree	Disagree	Undecided	Agree	Strongly agree	Contributions to the association (Inertia)	Pearson's Chi-square
In what form do you currently use tobacco?	Smoking	39	2	29	168	1372	3604	0.190	**p<0.001**; χ^2=49.756; df=12
	Smokeless	145	1	3	32	293	568	0.245	
	Both	17	5	25	105	1021	2178	0.234	
	I do not use tobacco in any form	225	0	6	7	84	294	**0.331**	
Have you ever tried or experiment with cigarette smoking even one or two puffs?	No	121	3	28	82	847	2076	0.69	p=0.057; χ^2=9.194; df=4
	Yes	305	5	35	230	1923	4568	0.31	
If yes. How old were you when you first tried a cigarette?	<10	24	0	1	19	139	393	0.152	**p<0.001**; χ^2=55.109; df=20
	11-15	72	0	9	58	440	1149	0.176	
	16-17	42	3	6	27	305	625	0.102	
	18-19	61	1	3	52	410	936	0.026	
	20-29	83	1	14	68	585	1241	0.016	
	>30	23	2	6	14	199	308	**0.527**	
For current smokers: During the past 30 days (one month), on	0 day	1	1	13	128	156	1	**0.429**	**p<0.001**; χ^2=55.673;
	1-2	2	8	12	109	260	2	0.173	

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how many days did you smoke cigarettes?	3-5	0	0	5	62	94	0	0.089	df=20
	6-9	0	0	1	34	57	0	0.02	
	10-19	1	0	6	32	122	1	0.275	
	20-29	0	0	0	13	33	0	0.013	
	All 30 days	0	8	29	226	450	0	0.001	
For current smokers: Have you smoked cigarettes on hospital/Clinic/Institute/Sub center premises during the past year?	Yes	32	0	7	25	222	482	0.86	p=0.147; χ^2=6.800; df=4
	No	197	4	22	146	1223	3136	0.14	
Have you ever used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew)?	Yes	266	5	40	176	1751	4145	0.376	p=0.233; χ^2=5.580; df=4
	No	160	3	23	136	1019	2499	0.624	
If yes. During the past 30 days (one month), on how many days did you use smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew)?	1-2	83	3	16	44	470	1376	**0.352**	**p<0.001**; χ^2=70.339; df=20
	3-5	24	0	4	21	143	384	0.025	
	6-9	13	1	0	11	112	175	0.275	
	10-19	28	2	4	15	222	401	0.163	
	20-29	13	0	6	4	79	210	0.082	
	All 30 days	99	1	13	69	706	1487	0.102	
For smokeless tobacco users: Have you used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) in hospital/Clinic/Institute/Sub center's premises during the past year?	Yes	185	4	20	133	1291	2806	0.418	p=0.214; χ^2=5.807; df=4
	No	133	2	25	108	886	2038	0.582	

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Table 4.64. Correspondence Analysis on the frequency distribution to test the association between socio-demographic characters and attitude towards tobacco use among health care professionals. The p values for statistically significant inferences are indicated in bold, and the inertia values for the variable contributing highest to the corresponding association are also indicated in bold in statistically significant inferences. (n=426)

Socio-demographic characteristics		Age Frequency	Attitude Score Frequency					Correspondence Analysis	
			Strongly disagree	Disagree	Undecided	Agree	Strongly agree	Contributions to the association (Inertia)	Pearson's Chi-square
Age	18-29	151	2	23	98	911	2439	0.887	**p<0.001**; χ^2=50.720; df=12
	30-39	143	4	13	128	897	2224	**0.943**	
	40-49	80	0	12	50	604	1173	0.939	
	50-59	52	2	15	35	358	786	0.619	
Gender	Female	351	8	47	253	2176	5588	0.176	**p<0.001**; χ^2=46.260; df=4
	Male	75	0	16	59	594	1056	**0.824**	
Religion	Christian	420	8	58	302	2742	6549	0.01	**p<0.001**; χ^2=45.369; df=8
	Hindu	2	0	0	4	12	30	0.001	
	Others	4	0	5	6	16	65	**0.989**	
Marital status	Single	214	5	36	160	1275	3446	0.111	**p<0.001**; χ^2=124.607; df=12
	Married	197	3	23	144	1316	3044	0.01	
	Divorced	10	0	2	7	130	91	**0.776**	
	Widowed	5	0	2	1	49	63	0.103	
Family type	Extended	18	2	5	5	153	249	0.31	**p<0.001**; χ^2=86.500; df=8
	Joint	152	3	21	109	1131	2232	0.337	
	Nuclear	256	3	37	198	1486	4163	**0.354**	
Food habits	Non-vegetarian	396	4	52	285	2520	6246	0.051	**p<0.001**;
	Vegetarian	22	2	4	20	178	302	0.181	

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	Vegan	8	2	7	7	72	96	**0.769**	χ^2=90.940; df=8
Profession	Dentist	17	0	10	43	294	688	0.009	**p<0.001**; χ^2=84.427; df=16
	Doctor	45	0	1	4	62	324	**0.553**	
	MPHW	88	3	33	165	1466	3760	0.076	
	Nurse	236	2	6	37	277	598	0.055	
	Pharmacist	40	3	13	63	671	1274	0.306	
Organization	Government	277	7	47	197	1789	4330	0.31	p=0.356; χ^2=13.183; df=12
	Mission	43	1	4	29	256	699	0.337	
	Private	101	0	11	83	691	1538	0.354	
	NGO	5	0	1	3	34	77	0.31	
Work experience	≤10 years	251	0	1	0	12	237	0.371	p=0.261; χ^2=10.065; df=8
	11-20 years	86	0	0	0	13	76	0.549	
	≥21 years	89	0	0	0	9	78	0.08	

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Table 4.65. Pearson's Chi-square test on the frequency distribution to determine the association between tobacco use prevalence and socio-demographic characters among health care professionals. The p values for statistically significant inferences are indicated in bold. The degree of significance is presented in heat map.

Pearson's Chi-square Test	Age	Gender	Religion	Marital status	Family type	Food habits	Profession	Work experience	Organization
In what form do you currently use tobacco?	**p<0.001**; χ^2=44.407; df=12	**p<0.001**; χ^2=107.401; df=3	p=0.236; χ^2=8.035; df=6	**p<0.001**; χ^2=41.741; df=9	p=0.191; χ^2=8.703; df=6	p=0.173; χ^2=9.009; df=6	**p<0.001**; χ^2=40.848; df=12	**p<0.01**; χ^2=20.474; df=6	p=0.090; χ^2=15.043; df=9
Have you ever tried or experiment with cigarette smoking even one or two puffs?	p=0.119; χ^2=7.331; df=4	**p<0.01**; χ^2=7.934; df=1	p=0.598; χ^2=1.029; df=2	p=0.775; χ^2=1.109; df=3	p=0.715; χ^2=0.670; df=2	p=0.126; χ^2=4.139; df=2	**p<0.01**; χ^2=19.622; df=4	p=0.539; χ^2=1.235; df=2	p=0.231; χ^2=4.300; df=3
If yes. How old were you when you first tried a cigarette?	**p<0.01**; χ^2=48.156; df=24	**p<0.001**; χ^2=30.295; df=6	p=0.740; χ^2=8.554; df=12	p=0.524; χ^2=16.986; df=18	p=0.430; χ^2=12.195; df=12	p=0.161; χ^2=16.699; df=12	**p<0.05**; χ^2=40.547; df=24	p=908; χ^2=6.159; df=12	p=0.052; χ^2=28.710; df=18
For current smokers: During the past 30 days (one month), on how many days did you smoke cigarettes?	p=0.565; χ^2=26.144; df=28	**p<0.001**; χ^2=138.969; df=7	**p<0.01**; χ^2=30.118; df=14	p=0.894; χ^2=13.393; df=21	p=0.362; χ^2=15.241; df=14	**p<0.01**; χ^2=34.552; df=14	**p<0.001**; χ^2=131.463; df=28	**p<0.05**; χ^2=25.970; df=14	**p<0.01**; χ^2=39.762; df=21
For current smokers: Have you smoked cigarettes on hospital/Clinic/Institute/Sub center premises during the past year?	p=0.928; χ^2=3.096; df=8	**p<0.001**; χ^2=81.526; df=2	p=0.128; χ^2=7.156; df=4	p=0.672; χ^2=4.034; df=6	p=0.448; χ^2=3.704; df=4	p=0.694; χ^2=2.226; df=4	**p<0.001**; χ^2=38.033; df=8	**p<0.01**; χ^2=18.237; df=4	p=0.622; χ^2=4.408; df=6
Have you ever used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew)?	p=0.113; χ^2=7.482; df=4	p=0.273; χ^2=1.199; df=1	**p<0.05**; χ^2=6.859; df=2	**p<0.05**; χ^2=8.285; df=3	p=0.084; χ^2=4.953; df=2	p=0.101; χ^2=4.590; df=2	p=0.412; χ^2=3.956; df=4	p=0.604; χ^2=1.010; df=2	p=0.570; χ^2=2.014; df=3
If yes. During the past 30 days (one month), on how many days did you use smokeless tobacco such as paan masala, zarda,	**p<0.001**; χ^2=67.577; df=24	p=0.921; χ^2=1.987; df=6	p=0.770; χ^2=8.194; df=12	**p<0.01**; χ^2=38.077; df=18	p=0.293; χ^2=14.119; df=12	**p<0.05**; χ^2=22.475; df=12	p=0.514; χ^2=23.105; df=24	p=0.135; χ^2=17.400; df=12	**p<0.05**; χ^2=32.018; df=18

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gutkha, khaini, paan or tuibur (tobacco brew)?									
For smokeless tobacco users: Have you used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) in hospital/Clinic/Institute/Sub center's premises during the past year?	**p<0.001**; χ^2=41.670; df=8	p=0.359; χ^2=2.046; df=2	p=0.211; χ^2=5.841; df=4	**p<0.001**; χ^2=26.723; df=6	p=0.400; χ^2=4.047; df=4	p=0.192; χ^2=6.104; df=4	p=0.396; χ^2=8.398; df=8	p=0.746; χ^2=1.943; df=4	**p<0.05**; χ^2=15.933; df=6

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4.10: Analysis of multiple binary logistic regression on predictors of tobacco use among healthcare professionals.

A multiple regression analysis was carried out to predict tobacco use habits (dependent variable) from genders, age, professions, tobacco use cessation and exposure to environmental tobacco smoke (independent variables). These independent variables statistically significantly predicted tobacco use habits, $p<0.001$ in all the five models, $R^2=0.136–0.441$. All five variables contributed statistically significantly to the prediction in the first four models, $p<0.05$. Moreover, four variables contributed statistically significantly to the prediction in the fifth model, $p<0.05$; while a single variable (profession) does not contribute statistically significantly in the prediction in this fifth model.

Table 4.66. Model summary for the predictors (genders, age, professions, tobacco use cessation and exposure to environmental tobacco smoke) of tobacco use habits (dependent variable) among healthcare professionals using multiple regression analysis.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1.	0.369[a]	0.136	0.134	3.58745
2.	0.405[b]	0.164	0.160	3.53339
3.	0.427[c]	0.183	0.177	3.49869
4.	0.659[d]	0.434	0.429	2.91420
5.	0.664[e]	0.441	0.434	2.89992

Table 4.67. Statistical test using ANOVA to see whether the regression model is fit.

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	862.190	1	862.190	66.993	**<0.001[b]**
	Residual	5456.808	424	12.870		
	Total	6318.998	425			
2	Regression	1037.899	2	518.949	41.566	**<0.001[c]**
	Residual	5281.099	423	12.485		
	Total	6318.998	425			
3	Regression	1153.362	3	384.454	31.407	**<0.001[d]**
	Residual	5165.636	422	12.241		
	Total	6318.998	425			

4	Regression	2743.618	4	685.905	80.765	**<0.001[e]**
	Residual	3575.379	421	8.493		
	Total	6318.998	425			
5	Regression	2786.990	5	557.398	66.282	**<0.001[f]**
	Residual	3532.008	420	8.410		
	Total	6318.998	425			

Table 4.68. Coefficient table to see the statistically significant contribution of each independent variables to the prediction of the dependent variable.

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	Std. Error	Beta		
1	(Constant)	0.943	0.564		1.671	.095
	b) Gender	3.735	0.456	0.369	8.185	**<0.001**
2	(Constant)	-.312	0.649		-.481	0.631
	b) Gender	3.688	0.450	0.365	8.201	**<0.001**
	a) Age in years	0.629	0.168	0.167	3.751	**<0.001**
3	(Constant)	-1.869	0.818		-2.284	**<0.05**
	b) Gender	3.679	0.445	0.364	8.262	**<0.001**
	a) Age in years	0.670	0.166	0.178	4.024	**<0.001**
	g) Profession	0.455	0.148	0.136	3.071	**<0.01**
4	(Constant)	7.700	0.976		7.886	**<0.001**
	b) Gender	1.809	0.395	0.179	4.576	**<0.001**
	a) Age in years	0.699	0.139	0.186	5.043	**<0.001**
	g) Profession	0.258	0.124	0.077	2.077	**<0.05**
	Tobacco Use Cessation	-1.070	0.078	-.538	-13.684	**<0.001**
5	(Constant)	7.360	0.983		7.487	**<0.001**
	b) Gender	1.759	0.394	0.174	4.466	**<0.001**
	a) Age in years	0.701	0.138	0.186	5.077	**<0.001**
	g) Profession	0.209	0.126	0.062	1.664	0.097
	Tobacco Use Cessation	-1.039	0.079	-.523	-13.165	**<0.001**
	Tobacco Use Environment	0.119	0.052	0.086	2.271	**<0.05**

A multiple regression analysis was carried out to predict attitude towards tobacco use (dependent variable) from family, food habits, and training on tobacco (independent variables). These independent variables statistically significantly predicted attitude towards tobacco use, $p<0.05$ in all the three models, R^2 =0.010–0.071. All three variables contributed statistically significantly to the prediction in

the first and third models, $p<0.05$; while the variable food habits do not contribute statistically significantly in the prediction in the second model.

Table 4.69. Model summary for the predictors (family, food habits, and training on tobacco) of attitude on tobacco use (dependent variable) among healthcare professionals using multiple regression analysis.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.098[a]	0.010	0.007	8.22488
2	0.148[b]	0.022	0.017	8.18276
3	0.267[c]	0.071	0.065	7.98292

Table 4.70. Statistical test using ANOVA to see whether the regression model is fit.

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	275.702	1	275.702	4.075	**<0.05[b]**
	Residual	28683.014	424	67.649		
	Total	28958.716	425			
2	Regression	635.654	2	317.827	4.747	**<0.01[c]**
	Residual	28323.062	423	66.958		
	Total	28958.716	425			
3	Regression	2065.897	3	688.632	10.806	**<0.001[d]**
	Residual	26892.819	422	63.727		
	Total	28958.716	425			

Table 4.71. Coefficient table to see the statistically significant contribution of each independent variables to the prediction of the dependent variable.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	107.115	1.816		58.973	**<0.001**
	e) Family	1.398	0.693	0.098	2.019	**<0.05**
2	(Constant)	110.330	2.278		48.438	**<0.001**
	e) Family	1.280	0.691	0.089	1.853	0.065
	f) Food habit	-2.674	1.153	-.112	-2.319	**<0.05**
3	(Constant)	103.414	2.659		38.897	**<0.001**
	e) Family	1.381	0.674	0.096	2.048	**<0.05**
	f) Food habit	-2.607	1.125	-.109	-2.317	**<0.05**
	Tobacco Training	1.201	0.254	0.222	4.737	**<0.001**

In every model, the variable "Family" significantly predicts the dependent variable. In models two and three, the variable "Food habit" significantly predicts the dependent variable. In model 3, the variable "Tobacco Training" significantly predicts the dependent variable. The positive coefficients for "Food habit" and "Family" show that rising levels of these variables are linked to rising levels of the dependent variable. A rise in "Tobacco Training" is linked to an increase in the dependent variable, as indicated by the positive coefficient for this variable.

CHAPTER-V

DISCUSSION, SUMMARY AND CONCLUSION

This chapter deals with the summary of major findings, discussions, limitations, recommendations for future study, summary and conclusions.

Statement of the problem.

Prevalence, habits, and attitude towards tobacco use among healthcare professionals.

Objectives of the study.

1. To identify the prevalence of tobacco use among healthcare professionals.
2. To compare the prevalence of tobacco use among healthcare professionals.
3. To assess the habit of health care professionals on tobacco use.
4. To evaluate the attitude of health care professionals on tobacco use.
5. To inspect a relationship between the prevalence of tobacco use and attitude among health care professionals.
6. To find out the association between the attitude of health care professionals on tobacco use with their selected demographic variables.
7. To detect the association between the prevalence of tobacco use among healthcare professionals with their selected demographic variables.

Hypothesis.

H_1 There is a significant relationship between the prevalence of tobacco use and attitude among healthcare professionals.

H_2 There is a significant association between tobacco use prevalence among healthcare professionals and their selected demographic variables.

H_3 There is a significant association between attitudes toward tobacco use among healthcare professionals and their selected demographic variables.

5.1: Major findings.

5.1.1: Major findings based on the socio-demographic characteristics of healthcare professionals under study.

Maximum number of the participants 35.4%, are in age group 18–29, 33.6% in the age group 30-39, 18.8% are 40–49 age group and 2% are in 50–59 age group. Majority of the participants 82.4% are female while male are 17.6%. Regarding religion of the participants, 98.6% are Christian, Hindus 0.5% and Others 0.9%. The majority of participants 50.2% are single, while 46.2% are married, 2.3% are divorced, and 1.2% are widowed.

The majority 60.1% belongs to nuclear family, 35.7% joint families and extended families 4.2%. 93.0% of the participants are non-vegetarian, whereas 5.2% are vegetarian and only 1.9% are vegan. Participants' professional representation is as follows: 55.4% are, nurses, MPHW 20.7%, Doctors 10.6%, Pharmacist 9.4%, and Dentist 4%.

The vast majority of participants 64.49 % are currently employed by government agencies, 23.94% in private organizations and mission organizations 10.57%. 58.9% of the participants have worked experience for 10 years or less. 20.2% had 11–20 years of work experience, 20.9% participants had 21 years or more.

5.1.2: Major findings related to prevalence of tobacco use among healthcare professionals.

Among 426 of the participants 201 are current users of tobacco and 225 of them do not use tobacco in any form. The percentage of tobacco users among the healthcare professions under study is 47.2%.

The difference in the frequency distribution of current users of tobacco across the different professions is statistically significant ($p<0.01$).

The difference in the frequency distribution of smoking tobacco users across the different professions is statistically significant ($p<0.01$). The difference in the

frequency distribution of smokeless tobacco users across the different professions is statistically significant ($p<0.001$).

The differences in the frequency distribution within all the professions for the types of tobacco usage is statistically significant in each profession viz. dentists ($p<0.05$); doctors ($p<0.01$); MPHW ($p<0.001$); nurses ($p<0.001$); and pharmacists ($p<0.01$).

The frequency difference in the age group within each profession on how old the participants were when they tried cigarette smoking for the first time is also statistically significant among MPHW ($p<0.001$; highest in 20–29 years old (16); lowest in 10 years or younger (2); nurses ($p<0.001$; highest in 20–29 years old (51); lowest in 16–17 years (12) and 30 years or older (12); and pharmacists ($p<0.05$; highest in 18–19 years old (12); lowest in 10 years or younger (1).

The frequency difference on whether the participants have ever used smokeless tobacco or not is statistically significant among MPHW ($p<0.01$; have used=59, never used=29); nurses ($p<0.01$; have used=139, never used=97); and pharmacists ($p<0.01$; have used=29, never used=11)

5.1.3: Major findings related to comparison of prevalence of tobacco use among healthcare professionals.

The test on one-way ANOVA for the prevalence of tobacco use across different professions showed statistically significant difference ($p<0.05$).

The test on one-way ANOVA for the habits of tobacco use across different professions also showed statistically significant difference ($p<0.001$).

Moreover, pos hoc determined statistically significant difference between nurses and MPHW ($p<0.001$)

5.1.4: Major findings related to tobacco use habits among the healthcare professionals.

Smoking:

The frequency difference on how soon the participants smoked his/her first cigarette after waking up is statistically significant ($p<0.01$; highest during 0–5 mins and 31–60 mins (9; 16.1%), lowest during 6–30 mins (8; 14.3%).

The frequency on the amount of cigarette smoked per day is highest for 10 or less (40; 71.4%) and lowest for 21–30 cigarettes, and this frequency distribution is also statistically significantly different ($p<0.001$).

A total of 47 (83.9%) participants want to stop smoking cigarette now while 9 (16.1%) of them did not want to stop smoking, and the frequency difference is statistically significant ($p<0.001$).

A total of 34 (60.7%) have tried to stop smoking cigarettes during the past year, while 22 (39.3%) have never been trying to stop smoking during the past years, and the frequency difference is also statistically significant ($p<0.001$).

***Smokeless Tobacco*:**

During the past 30 days (one month), 84 (51.9%) of the participants have used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) during all 30 days, while those who used only 6 to 9 days is the least (5; 3.1%) with a statistically significant frequency distribution ($p<0.001$).

A total of 136 (84.0%) participants have used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) in the hospital/Clinic/Institute/ Sub canter's premises during the past year while 26 (16.0%) have never used smokeless tobacco in the aforementioned premises, and the frequency difference is statistically significant ($p<0.001$).

The frequency of participants who used smokeless tobacco even when they are so ill that they are in bed most of the day is lower (43; 26.5%) compared to those

who never used smokeless tobacco in such kind of condition (119; 73.5%), and the frequency difference is statistically significant ($p<0.001$).

A total of 132 (81.5%) participants want to stop using smokeless tobacco now while 30 (18.5%) of them did not want to stop using smokeless tobacco, and the frequency difference is statistically significant ($p<0.001$).

5.1.5: Major findings related to Exposure to Environmental Smoke among the healthcare professionals.

The difference on the mean rank for exposure to environmental tobacco smoke among different professions under studied is 193.36 (nurses) to 256.89 (MPHW), and comparison on the mean rank differences using Kruskal Wallis test is statistically significant ($p<0.001$).

5.1.6: Major findings related to cessation of tobacco use among the healthcare professionals.

The difference on the mean rank scored for tobacco use cessation among different professions (n=426) under studied is 164.10 (pharmacists) to 240.21 (nurses), and comparison on the mean rank differences using Kruskal Wallis test is statistically significant ($p<0.001$).

Among previous and current users of smoking tobacco with regardless of profession (n=130), differences in the frequency on whether the participant have ever received help or advice to help you stop smoking cigarettes is statistically significant ($p<0.001$) where the observed frequency is lower (41) for those who received help or advise, and highest (89) for those who did not receive any help or advise to help stop smoking.

5.1.7: Major findings related to previous training attended by healthcare professionals regarding tobacco.

The mean rank on training towards tobacco use is highest in nurses (224.85) and lowest in pharmacists (159.0). However, upon testing using Kruskal Wallis test,

the comparison on the mean rank across different professions is statistically significant ($p<0.01$)

5.1.8: Major findings related to attitude of healthcare professionals regarding tobacco use.

The mean rank on attitude towards tobacco use is highest in dentists (278.0) and lowest in doctors (197.97). However, upon testing using Kruskal Wallis test, the comparison on the mean rank across different professions is not statistically significant ($p>0.05$)

5.1.9: Relationship between tobacco use prevalence and attitude towards tobacco.

The null hypothesis H_0 is rejected and accepted the alternative hypothesis H_1 stating that there is a significant relationship between the prevalence of tobacco use and attitude among healthcare professionals.

5.1.10: The association between socio-demographic characters and attitude towards tobacco use among healthcare professionals.

The null hypothesis H_0 is rejected and accepted the alternative hypothesis H_2 stating that there is a significant association between attitudes toward tobacco use among healthcare professionals and their selected demographic variables.

5.1.11: The association between tobacco use prevalence and socio-demographic characters among health care professionals.

The null hypothesis H_0 is rejected and accepted the alternative hypothesis H_3 stating that there is a significant association between tobacco use prevalence among healthcare professionals and their selected demographic variables.

5.1.12: Predictors of tobacco use habits and attitude among health care professionals.

From multiple regression analysis it was revealed that (dependent variable) such genders, age, professions, tobacco use cessation and exposure to environmental tobacco smoke statistically significantly predicted tobacco use habits, $p<0.001$ in all

the five models, R^2=0.136–0.441. All five variables contributed statistically significantly to the prediction in the first four models, $p<0.05$. Moreover, four variables contributed statistically significantly to the prediction in the fifth model, $p<0.05$; while a single variable (profession) does not contribute statistically significantly in the prediction in this fifth model.

A multiple regression analysis also revealed (dependent variable) family, food habits, and training on tobacco (independent variables) statistically significantly predicted attitude towards tobacco use, $p<0.05$ in all the three models, R^2 =0.010–0.071. All three variables contributed statistically significantly to the prediction in the first and third models, $p<0.05$; while the variable food habits do not contribute statistically significantly in the prediction in the second model.

5.2: Discussions.

Discussion will take into account the study's aims, which are in line with the goals and hypothesis.

5.2.1: Demographic Characteristics of the participants.

In this study the age distribution of participants is between 18 and 59 years old, with the largest percentages falling into the 18–29 and 30-39 age groups (35.4% and 33.6%, respectively). With a sizable percentage of professionals in the early to middle phases of their careers, this indicates that Mizoram's healthcare workforce is relatively young. This result aligns with research carried out in other areas. According to research conducted in South West Nigeria, the majority of medical professionals were between the ages of 25 and 54, with 31.75% of them being between the ages of 45 and 54. Of these, 42.13% were men and 57.87% were women (Omole et al. 2024).

Majority of the participants in the present study were female 82.4% and a distinctively lesser number 17.6% were male. This distribution indicates a higher representation of females within the healthcare workforce in Mizoram. As an illustration of the global trend of rising female engagement in the healthcare industry, a study carried out in Mosul City by Ahmed et al. (2021) also found a greater

proportion of female healthcare workers, with a male to female participation ratio of 47.62%:52.38 and by Hodgetts et al. (2004) study conducted in Bosnia and Herzegovina, with a male to female participation ratio of 8.8% to 91.2%.

The vast majority of participants of this study 64.49 % are currently employed by government agencies, 23.94% in private organizations and mission organizations 10.57%. The result suggests that healthcare professionals in Mizoram are inclined to seek employment in Public Sector more than private sector, as oppose to the result of Omole et al.'s (2024) study conducted in Southwest Nigeria found that a greater proportion of medical professional's work in private healthcare institutions (44.38%) as opposed to public ones (37.63%). A South African study also found that professional workers are more likely to leave the public sector for the private sector than the other way around, and that the private sector is more attractive and retains personnel than the public sector (Khan, 2018).

5.2.2: Prevalence of tobacco use among healthcare professionals.

The study reported the prevalence of tobacco use among the healthcare professionals in Mizoram as 47.2% (smoking 9.2%%, smokeless 34%, both smoking and smokeless 4%). This prevalence rate is lower than the prevalence rate among general population of Mizoram (77.1%) (Government of Mizoram DP&PR 2022). Pakistan reported a higher prevalence of 57.6% (Malik et al. 2019). Tobacco use prevalence among healthcare professionals in this study is comparable but still higher to a study from Italy that reported 44% prevalence (Ficarra et al. 2011), in Serbia prevalence is 45.60% (Stojanović et al. 2013). But the prevalence of tobacco use in the study is much higher than the prevalence reported from Palestinian 34.5% (Mizher at al. 2018), Mosul City 33.33% (Ahmed at al. 2021) from Southwest Nigeria 9.13% (Omole et al. 2024), from Soweto 22% (Alagidede et al. 2024), from Spain 12.3% (Sanmartin et al. 2019), and from Bihar & Jharkhand, India 15.9% (Biswas et al. 2024).

This study revealed a high rate of prevalence of tobacco use among healthcare professionals since a total of 47.2% (n=426) of the participants are present tobacco users. This implies that a sizable percentage of the medical staff have used

tobacco products in the past or are now using them, which may make them less credible when promoting tobacco cessation and their duties related to health promotion.

There is variation in frequency regarding tobacco use prevalence among the categories of healthcare professionals under studied. Prevalence is 53.3% among doctors, 35.3% among dentists, 41.9% among the nurses, 52.5% among pharmacists and 58% among MPHW which is higher than the rate in a similar kind of study by AlMulla et al. (2021) where the incidence of tobacco usage among health care workers was 16.3% (n=1178), 11.0% among doctors, 10.9% among nurses, 29.5% among dentists, 12.7% among chemists, and 17.6% among other professions. According to a meta-analysis on tobacco prevalence among healthcare workers, the highest pooled prevalence was found among nurses and mixed hospital staff (24%, 95% CI 22–26) and 24%, 95% CI 21–28), respectively, while the lowest was found among pharmacy HCW (14%, 95% CI 8–20) Nilan et al. (2019). In Qatar, 11.0% of doctors, 10.9% of nurses, 29.5% of dentists, 12.7% of pharmacist, and 17.6% of other professionals used tobacco (AlMulla et al.2021). These support the findings of the present study, The difference in the frequency distribution of current users of tobacco across the different professions is statistically significant ($p<0.01$).

The prevalence of smoking among the healthcare professionals in Mizoram is 13.2% (smokers 9.2%+ both smoking and smokeless 4%), lower than the prevalence of smokers among the general population which is 43.6% (Government of Mizoram DP&PR, 2022). Ficarra et al. (2011) in their study reported that Smoking prevalence is significantly different according to some factors such as profession. Zinonos et al. (2016) also reported smoking prevalence among physicians and nurses were 28.6 and 28.1 % respectively. Calgan et al. (2007) reported 38.6% of pharmacist as active smokers. Among Dentist prevalence of smoking was 17.2% Alomari et al. (2006). These study reports are in line with the findings from the present study that reported a difference in the frequency distribution of smoking tobacco users across the different professions which is statistically significant ($p<0.01$). In this study 9.2% responded as smoking tobacco users and 4.0% as user of both smoking and smokeless tobacco. Across the profession, frequency of smokers is highest among

MPHW (17% smoking, 4 % Both smoking and smokeless) and lowest among Dentists (3% smoker and NIL in user of Both smoking and smokeless). While among the Doctors 8% are smokers and 2% both smoking and smokeless, Nurses 5% smokers, 7% both smoking and smokeless and Pharmacist 6% smokers and 4% both smoking and smokeless. The differences in the frequency distribution within all the professions for the types of tobacco usage is statistically significant in each profession viz. dentists ($p<0.05$); doctors ($p<0.01$); MPHW ($p<0.001$); nurses ($p<0.001$); and pharmacists ($p<0.01$).

From the result of the study we can comprehend the frequency difference in the age group within each profession on how old the participants were when they tried cigarette smoking for the first time which is also statistically significant among MPHW ($p<0.001$; highest in 20–29 years old (16); lowest in 10 years or younger (2); nurses ($p<0.001$; highest in 20–29 years old (51); lowest in 16–17 years (12) and 30 years or older (12); and pharmacists ($p<0.05$; highest in 18–19 years old (12); lowest in 10 years or younger (1).This findings presents an important insight since the age of initiation of tobacco use directly affect the nicotine dependence as is evidenced by the study Komiyama et al. (2023) revealed that the smoking initiation age group under 20 years old reported higher respiratory CO levels (19.3±13.5 vs. 16.5±11.9), higher FTND scores (7.4±2.0 vs. 6.3±2.2), and more cigarettes per day (25±12 vs. 22±12, p value<0.001 and adjusted p-value=0.002) than the group of smoking initiation age group ≥20 years old. These findings were supported by significant p-values and adjusted p-values of less than 0.001.

The result of the present study suggests a difference in the frequency distribution of smokeless tobacco users across the different professions as statistically significant ($p<0.001$). The prevalence of smokeless tobacco use among the healthcare professionals in Mizoram is 38% which is lower than the 54.1% prevalence among the general population (Government of Mizoram DP&PR, 2022). Smokeless tobacco use is considerably more common among nurses (36.7%), MPHWs (34.1%), physicians (31.1%), pharmacists (27.5%), and dentists (17.6%). A LASI study (Longitudinal Aging Study in India) conducted by Bharati et al. (2023). The percentage of Indians that use smokeless tobacco is 51%. According to the

pattern, SLT usage is still more socially acceptable than smoking tobacco use (Jodalli et al. 2020).

The alarming level of prevalence of smokeless tobacco use, especially among the nurses 87 (36.9%), is an indication of the strong urgent need to focus attention on program for healthcare professionals towards tobacco cessation in order to enable them to stop the use themselves as well as assist others in cessation activity.

5.2.3: Comparison of the prevalence of tobacco use among healthcare professionals.

Result from the study suggest statistically significant difference ($p<0.05$) in the prevalence of tobacco use across different professions studied. The mean of prevalence of tobacco use is highest among pharmacists and lowest among nurses. The mean of tobacco use habit is highest among MPHW and lowest among Nurses. The result also displays statistically significant difference ($p<0.001$) in the habits of tobacco use across different healthcare professions. The pos hoc test determined statistically significant difference between nurses and MPHW ($p<0.001$). The prevalence of tobacco use was comparatively low among nurses (0.8%) and LWs (2.2%) in comparison to physicians (7%); this difference was statistically significant for both smoking and smokeless tobacco, according to a study by Mony et al. (2015). Present study findings is supported by the similar study conducted by Ficarra et al. (2011) that found a significant difference ($p<0.01$) in the prevalence of tobacco use among various healthcare occupations. On the other hand, Mizher et al. (2018) and Juranić et al. (2017) did not find this significance in their similar studies.

5.2.4: Habit of health care professionals on tobacco use.

Smoking habits:

The present study reported that the frequency difference on how soon the participants smoked his/her first cigarette after waking up is statistically significant ($p<0.01$; highest during 0–5 mins and 31–60 mins (9; 16.1%), lowest during 6–30 mins (8; 14.3%). Similar results were found in the study report by Hameed et al. (2024), where the majority of individuals (73.9%) smoked within 30 minutes of

waking up, and 94.7% did so within an hour. However, roughly 43.8% of these smoked within 5 minutes of waking up. Furthermore, the findings of the Grainge et al. (2009) study are consistent with the current investigation. It stated that cigarettes smoked between 2 and 10 a.m. were smoked less intensely than other cigarettes, and that the total smoke volume was shown to be substantially linked with the time the cigarette was smoked ($P < 0.001$). Smoking the first cigarette after waking up was somewhat less intense than smoking other cigarettes, and this difference was significant if it was smoked within five minutes of waking up ($P = 0.004$). According to this study, those who smoke cigarettes in the early morning and at night, including their first cigarette of the day, puff less vigorously. Given the significance of the first cigarette of the day and the diurnal smoking patterns for assessing dependence, cessation, and relapse, this is a potentially significant discovery that warrants further investigation.

The frequency on the amount of cigarette smoked per day in the present study is highest for 10 or less (40; 71.4%) and lowest for 21–30 cigarettes, and this frequency distribution is also statistically significantly different ($p<0.001$). In their study, Omole et al. (2024) found a similar pattern of smoking behaviour: 57.53% of participants smoke fewer than five cigarettes per day, 42.47% smoke five to ten cigarettes per day, and none smoke more than eleven cigarettes per day. The National Cancer Institute (2016) found that individuals who smoked between one and ten cigarettes a day had an 87 percent higher risk of dying young than those who never smoked, and those who smoked an average of fewer than one cigarette per day over their lifetimes had a 64 percent higher risk than those who never smoked. According to Bjartveit's (2005) research, women who smoke 1-4 cigarettes a day are at a much greater risk of dying from lung cancer, ischaemic heart disease, and other reasons. Effective and convincing interventions are required to warn and influence healthcare personnel who smoke to quit immediately.

This study reported that a total of 17 (30.4%) participants smokes more frequently during the first hours after waking than during the rest of the day while 39 (69.6%) of them do not implement this habit; the frequency difference is also statistically significant ($p<0.01$). This finding in line with Hameed et al. (2024) who

also stated that the majority of their study participants (64.3%) had not consumed tobacco during the first hour of the day.

The present study reported that frequency of participants who smoke even when they are so ill that they are in bed most of the day is lower (14; 25%) compared to those who never smoke in such kind of condition (42; 75%), and the frequency difference is statistically significant ($p<0.01$). However, this finding is in contradiction to Hameed et al. (2024) study that revealed 63.6% of the individuals in the study used tobacco products while being ill. Smoking is known to be bad for one's physical and mental health, yet these studies show that smoking is continued even when one is ill. This finding could be interpreted as a significant sign of the need for healthcare professionals to start a tobacco cessation program immediately in order to improve their physical and emotional well-being.

In the present study, a total of 47 (83.9%) participants want to stop smoking cigarette now while 9 (16.1%) of them did not want to stop smoking, and the frequency difference is statistically significant ($p<0.001$). The study revealed that a total of 34 (60.7%) smokers have tried to stop smoking cigarettes during the past year, while 22 (39.3%) of have never been trying to stop smoking during the past years, and the frequency difference is also statistically significant ($p<0.001$). These answers may indicate that healthcare professionals require specific training on quitting smoking in order to increase their ability to quit and to advocate for tobacco cessation on behalf of the general public (Pianori et al. 2017).

Smokeless tobacco use habits:

More than 85% of the ST-related burden occurred geographically in South and Southeast Asia, with Bangladesh contributing 5% of lost DALYs, Pakistan 7%, and India 70%. ST is used worldwide and is mostly a public health concern in South and Southeast Asia. It is necessary to fully apply the World Health Organisation Framework Convention for Tobacco Control in order to restrict the use of ST (Siddiqi et al. 2020).

The present study also contributes to validate the burden of smokeless tobacco use by identifying 38 % smokeless tobacco users among the participants. The habits of the participants smokeless tobacco use are another cause for concern because during the past 30 days (one month), 84 (51.9%) of the participants have used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) during all 30 days, while those who used only 6 to 9 days is the least (5; 3.1%) with a statistically significant frequency distribution ($p<0.001$). The frequency of participants who used smokeless tobacco even when they are so ill that they are in bed most of the day is lower (43; 26.5%) compared to those who never used smokeless tobacco in such kind of condition (119; 73.5%), and the frequency difference is statistically significant ($p<0.001$). In spite of vast awareness regarding harmfulness of tobacco even among general population. Our study recorded a prevalence rate of smokeless tobacco 34% which is even higher than smoking rate 13.2%. Therefore, coordinated efforts are required to improve access to evidence-based cessation therapies, tighten regulatory measures, and increase knowledge of the health care professionals associated with smokeless tobacco use. We can work to lessen the burden of this avoidable illness and protect public health globally by addressing the many factors that contribute to smokeless tobacco-related oral cancer (Noor et al. 2024).

5.2.5: Exposure to Environmental Smoke among the healthcare professionals.

There are forty-three recognised carcinogens among the hundreds of compounds found in ambient tobacco smoke. Based on epidemiologic data and understanding of the absorption and metabolism of environmental tobacco smoke, lung cancer in nonsmokers is one of the most significant recognised health impacts of exposure to this type of smoke Brownson et al. (2002). The present study explores the existence of exposure to environmental tobacco smoke among the study participants. The difference on the mean rank for exposure to environmental tobacco smoke among different professions under studied is 193.36 (nurses) to 256.89 (MPHW), and comparison on the mean rank differences using Kruskal Wallis test is statistically significant ($p<0.001$). Therefore, each profession under studied presented a certain level of observation rate of environmental smoke exposure in their home,

workplace and other places. The data from the study suggest that the healthcare professional themselves require enhancement training on harmful effects of tobacco.

Prohibition of Smoking in Public Places rules 2008 issued on May 2008 and came in to force on 2nd October 2008 in India MoHFW (2008). In compliance with this prohibition, Additionally, the Government of Mizoram's Directorate of Health Services issued Memorandum No.A.A.60018/1/2021-DHSE, which forbade smoking in workplaces. dated May 23, 2023, stating that a punishment of Rs. 200 will be imposed for breaking the rule Health & FW Department (2023). Despite the clear implementation of smoking prohibition in public/work place by the central and state government, upon enquiry into whether the participants' hospital/clinic/Institute/Sub center/organization have official policy banning smoking at work place? Out of 426 participants 65 of them replied NO. Further enquiry regarding whether the participant's hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced? Out of 426 participants a good 35 of them replied NO it is not enforced. The response could be due to the mere ignorance on the part of the respective participant of the existence of the policy at his/her workplace or it could be actual administrative lapse in the implementation of the policy for Prohibition of Smoking in the workplace. The suggestion of discrepancy in the implementation of official policy for banning smoking at work place in the study need further investigation as it could imply a violation of the Prohibition law. It also suggests that more stringent measures must be taken to make workplaces smoke-free because smoke-free environments not only shield non-smokers from the risks of passive smoking but also motivate smokers to cut back or stop (Fichtenberg et al. 2002).

5.2.6: Cessation of tobacco use among the healthcare professionals.

In the present study the difference on the mean rank scored for tobacco use cessation among different professions (n=426) under studied is 164.10 (pharmacists) to 240.21 (nurses), and comparison on the mean rank differences using Kruskal Wallis test is statistically significant ($p<0.001$).Among previous and current users of smoking tobacco with regardless of profession (n=130), differences in the frequency on whether the participant have ever received help or advice to help you stop

smoking cigarettes is statistically significant ($p<0.001$) where the observed frequency is lower (41) for those who received help or advise, and highest (89) for those who did not receive any help or advise to help stop smoking.

Despite the urgent need for health professionals who smoke to receive cessation treatment, there is still little data on the characteristics that predict quitting. Initially, additional theoretical work is needed to determine the pertinent predictors in order to properly direct future study. Secondly, these have to be evaluated through prospective research methods that employ a multi-focal viewpoint to elucidate the target for change (Evenhuis et al. 2023).

5.2.7: Previous training attended by healthcare professionals regarding tobacco.

From the study it is found that the mean rank on training towards tobacco use is highest in nurses (224.85) and lowest in pharmacists (159.0). However, upon testing using Kruskal Wallis test, the comparison on the mean rank across different professions is statistically significant ($p<0.01$). Similarly, According to Venkitachalam et al. (2019), 39% and 65% of nursing and dental students, respectively, have not had any official instruction in smoke cessation techniques. However, Shrestha et al. (2020) found that tobacco education was a part of the curriculum for healthcare professional courses, with 105 (92.9%) of the students stating that they had learnt about the risks of smoking in class. Singh et al. (2010) During their time in college, over 72% of the participants had received official training in smoking cessation approaches to use with patients. Smoking cessation programs are warranted in medical schools in Kerala Mohan et al. (2006). Sreeramareddy et al. (2010) further supported this report with research they did in which almost half of respondents agreed that tobacco smoking is taught in the current curriculum, but not in a systematic manner, and ought to be covered in a separate module. In training concerning tobacco smoking, the majority of students said that themes including health impacts, nicotine addiction and treatment, counselling, and relapse prevention were significant or extremely important. Therefore, based on the findings and observations from related studies it can be suggested that tobacco

concern training need be upgraded during the courses of study for healthcare profession.

5.2.8: Attitude of healthcare professionals towards tobacco use.

The mean rank on attitude towards tobacco use is highest in dentists (278.0) and lowest in doctors (197.97). Responses of the healthcare professionals to the questions regarding attitude towards tobacco use is given below in percentage side by side with a result from related studies.

Smoking is harmful to health: In the present study 91.8% strongly agreed and 8% agreed. The findings of the present study are supported by similar studies conducted by Singh et al. (2014)100%. Omole et al. (2024) 76.25 % Strongly agreed,17.37% agreed, 4.13% Neutral,2.25% Disagreed.

Second-hand smoke is harmful to health: In the present study 83.3% strongly agree, and 16.4% agreed. Smokeless tobacco is harmful to health: 74.9% strongly agreed and 22% % disagreed. Similar finding is presented by Singh et al. (2014) 100% agreed.

Smoking Ban Act is fair to the non-smokers: In the present study 66% strongly agreed 28.6% agreed and 0.9% disagreed. Similar result is seen in a study conducted by Sonmez et al. (2015) 93.5% agreed.

Smoking ban act is fair to the smokers: In the present study 46.5% strongly agreed, 36.9% agreed, 14.6% who were unsure, and 2.1% who disagreed.

Tobacco sales to adolescents should be banned: In the present study 66.9% strongly agreed, 26.3% agreed and 0.2% strongly disagreed. Similar studies supported the findings such as Venkitachalam et al. (2019) Dental 99% agreed. Nursing 59% agreed, Singh et al. (2014) 98.9% agreed.

Policies on cessation of smoking should be implemented in the healthcare settings: In the present study 71.4%, strongly agreed, 27.2% agreed and 1.4% were unsure. Singh et al. (2014) presented 95.6% agreed which is in line with the present study's findings.

One should be cautious about smoking in the presence of non-smokers: In the present study 77% strongly agreed, 22.1% agreed, 0.9% disagreed.

One should be cautious about the use of smokeless tobacco in the presence of non-smokers: In the present study 60.8% strongly agreed 31.9% agreed, 6.3% unsure, and 0.9% disagreed.

Healthcare professionals should not smoke in the presence of children: In the present study 82.4% strongly agreed, 17.4% agreed, 0.2% undecided. Similar study by Singh et al. (2014) 100% agreed, Sonmez et al. (2015) 97.7% agreed supported the present study's findings.

Healthcare professionals should not use smokeless tobacco in the presence of children: In the present study 74.6% strongly agreed, 22.8% agreed, and 2.6% were unsure.

It is the responsibility of the healthcare professionals to warn the smokers of the harmful effect of smoking: In the present study 72.1% strongly agreed, 27.5% agreed, and 0.5% were unsure. Similar study by Gualano et al. (2012) presented 97.2% agreed.

It is the responsibility of the healthcare professionals to warn the smokeless tobacco user of the harmful effect of tobacco use: In the present study 70% strongly agreed, 29.9% agreed.

It is the responsibility of the healthcare professionals to warn the pregnant women the harmful effects smoking has on the fetus: In the present study 82.9% strongly agreed, 16.7% agreed and 0.5% undecided.

It is the responsibility of the healthcare professionals to warn the pregnant women the harmful effects smokeless tobacco has on the fetus: In the present study 78.9% strongly agreed,19.5% agreed, while 1.6% were unsure.

Healthcare professionals serve as 'role models' for their patients and the public: In the present study 70.7% strongly agreed, 26.5% agreed, 2.1% were unsure, and 0.7% disagreed. The present study findings are consistent with findings of

similar study conducted by Venkitachalam et al. (2019) 86.9%, agreed Singh et al. (2014) 88.9% agreed, Sonmez et al. (2015) 96.2% agreed.

Healthcare professionals should routinely advise patients to stop smoking: In the present study 62.2% strongly agreed t,33.6% agreed,3.8% were undecided, and 0.5% disagreed. The present study findings are consistent with findings of similar study conducted by Venkitachalam et al. (2019) 97% said yes, Singh et al. (2014) 96.6%.

Healthcare professionals should routinely advise patients to stop using smokeless tobacco products: In the present study 59.9% strongly agreed ,36.2% agreed,3.3 % were undecided, and 0.7% disagreed. Venkitachalam et al. (2019) 100% said yes, 88% Said Yes

Healthcare professionals have a greater responsibility towards the harmful effects of tobacco use majority: In the present study 61% strongly agreed ,34.7% agreed,3.3% were undecided and 0.9% disagreed. Omole et al. (2024)76.87% said yes,12.25% said no and 8.25 % are not sure.

Healthcare professionals should attend specific training on tobacco cessation techniques: In the present study 59.2% strongly agreed, 38.7% agreed,1.9% were undecided and 0.2% disagreed. Venkitachalam et al. (2019) 97% agreed, Singh et al. (2014) 84.7% agreed, Gualano et al. (2012) 92.1% agreed, Sonmez et al. (2015) 86.6% agreed.

Healthcare organizations should open clinics to help people quit smoking: In the present study 59.6% of respondents strongly agreed, 36.6% agreed, and 3.8% were unsure.

The chances of patients quitting tobacco use increase if a healthcare professionals advise him/her: In the present study 46.5% strongly agreed, 45.3% agreed, 6.8% disagreed, 1.2% strongly disagreed and 6.8% were unsure. Venkitachalam et al. (2019) 84.8% said yes. Singh et al. (2014) 82.8% agreed, Sonmez et al. (2015) 86.6% agreed.

Healthcare personnel who smoke themselves are less likely to urge a patient to quit: In the present study 41.3% strongly,46.4% agreed, 7.3% were undecided, 4.2% who disagreed, and 0.7% who strongly disagreed. Singh et al. (2014) 64.6% agreed. Sonmez et al. (2015) 55.3% agreed. These similar studies supported the findings of the present study.

Healthcare professionals who use smokeless tobacco themselves are less likely to advise a patient to discontinue using smokeless tobacco products: In the present study 40.1% strongly agreed, 46% agreed, 8.2% were indecisive, 4.6% disagreed, and 0.7% strongly disagreed.

5.2.9: Relationship between tobacco use prevalence and attitude towards tobacco.

It was determined that the forms of tobacco use are having a statistically significant association with attitudes ($p<0.001$); the group who do not use tobacco in any form contributes 33.1% (inertia value=0.331) of the chi-square statistics and has stronger association with attitudes compared to smoking, smokeless and user of both groups. Among present smokers, how many days cigarettes was smoked during the past 30 days is having a statistically significant association with attitudes ($p<0.001$); participant who did not smoke at all during this time period contributes 42.9% (inertia value=0.429) of the chi-square statistics and has stronger association with attitudes compared to other groups. Likewise, among present users of smokeless tobacco, how many days was smokeless tobacco was used during the past 30 days is having a statistically significant association with attitudes ($p<0.001$); participant who used smokeless tobacco 1-2 days during this time period contributes 35.2% (inertia value=0.352) of the chi-square statistics and has stronger association with attitudes compared to other groups. Therefore, the null hypothesis H_0 is rejected and accepted the alternative hypothesis H_1 stating that there is a significant relationship between the prevalence of tobacco use and attitude among healthcare professionals.

5.2.10: The association between socio-demographic characters and attitude towards tobacco use among healthcare professionals.

It was determined that the age of the participants when they first tried cigarette smoking is having a statistically significant association with attitudes ($p<0.001$); participant >30 years contributes 52.7% (inertia value=0.527) of the chi-square statistics and has stronger association with attitudes compared to other age groups. It was also determined that age group is having a statistically significant association with attitudes ($p<0.001$); the age group of 30-39 contributes 94.3% (inertia value=0.943) of the chi-square statistics and has stronger association with attitudes compared to other age groups. Gender is having a statistically significant association with attitudes ($p<0.001$); male contributes 82.4% (inertia value=0.824) of the chi-square statistics and has stronger association with attitudes compared to female. Religion is inferred to be having a statistically significant association with attitudes ($p<0.001$); religious group "Others" contributes 98.9% (inertia value=0.989) of the chi-square statistics and has stronger association with attitudes compared to the other studied religious groups i.e. Christian and Hindu. Marital status is having a statistically significant association with attitudes ($p<0.001$); divorced participants contribute 77.6% (inertia value=0.776) of the chi-square statistics and has stronger association with attitudes compared to other marital status groups like single, married and widowed. Family type is having a statistically significant association with attitudes ($p<0.001$); although the three family types categorized in this study contributes almost uniformly, but nuclear family contributes 35.4% (inertia value=0.354) of the chi-square statistics and has stronger association with attitudes compared to other family types. Food habit is also having a statistically significant association with attitudes ($p<0.001$); vegan contributes 76.9% (inertia value=0.769) of the chi-square statistics and has stronger association with attitudes compared to non-vegetarians and vegetarians. The five different health care professions studied is also having a statistically significant association with attitudes ($p<0.001$); doctors contribute 55.3% (inertia value=0.553) of the chi-square statistics and has stronger association with attitudes compared to other professions. Therefore, the null hypothesis H_0 is rejected and accepted the alternative hypothesis H_2 stating

that there is a significant association between attitudes toward tobacco use among healthcare professionals and their selected demographic variables.

5.2.11: The association between tobacco use prevalence and socio-demographic characters among health care professionals.

There is significant association between the prevalence of tobacco use and socio-demographic characteristics. Forms of tobacco use is associated with socio-demographic characteristics such as age group ($p<0.001$), gender ($p<0.001$), marital status ($p<0.001$), profession ($p<0.001$) and work experience ($p<0.01$). Age when cigarette was tried for the first time is associated with demographic characteristics such as, age group ($p<0.01$) and food habit ($p<0.05$). Ever used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tubur (tobacco brew) is associated with demographic characteristics such as, religion ($p<0.05$) and marital status ($p<0.01$). Number of days smokeless tobacco is used in the past 30 days is associated with demographic characteristics such as, age group ($p<0.001$), religion ($p<0.05$), marital status ($p<0.05$), food habit ($p<0.05$) and work experience ($p<0.05$).Whether smokeless tobacco is used in hospital/Clinic/Institute/Sub canter's premises during the past year is associated with demographic characteristics such as, age group ($p<0.001$), gender ($p<0.001$) and marital status ($p<0.001$). Whether the participants smoked cigarette in hospital/Clinic/Institute/Sub canter's premises during the past year is associated with demographic characteristics such as, food habit ($p<0.001$) and work experience ($p<0.01$). Ever tried or experimented with cigarette smoking even one or two puffs is associated with demographic characteristics such as, age group ($p<0.01$) and food habit ($p<0.01$). Number of days of smoking cigarette in the past 30 days is associated with demographic characteristics such as, age group ($p<0.001$), religion ($p<0.01$), food habit ($p<0.01$) and work experience ($p<0.05$). Therefore, the null hypothesis H_0 is rejected and accepted the alternative hypothesis H_3 stating that there is a significant association between tobacco use prevalence among healthcare professionals and their selected demographic variables.

5.2.12: Predictors of tobacco use habits and attitude among health care professionals.

In this study from the multiple regression analysis, it was revealed that the variables "Gender", "Age in years", and "Profession" are consistently significant predictors of the tobacco habit, while "Tobacco Use Cessation" and "Tobacco Use Environment" are also significant predictors in certain models. A multiple regression analysis also revealed (dependent variable) family, food habits, and training on tobacco (independent variables) statistically significantly predicted attitude towards tobacco use, $p<0.05$. This may serve as a valuable information in understanding factors that effects the prevalence of tobacco better as well as in serving as a basis in planning for certain programme to control the prevalence. The attitude towards tobacco use is also strongly associated with family, food habits and training on tobacco. Providing well planned training on tobacco for the healthcare professionals may result in improvement of their attitude towards tobacco use.

5.3: Limitations of the study.

The empirical findings presented here should be interpreted in the context of several potential limitations: -

- Due to the ongoing Covid 19 Pandemic, the setting for the study is confined to only one district that is Aizawl District. Collecting data from all the eleven districts of Mizoram may produce a better generalizable result.
- The researcher opted for proportionate stratified sampling technique but due to a great difference in the actual population of the healthcare professionals selected for the study, it resulted in variation in the sample size from each of the profession. Same sample size from each stratum/profession might give a better representation and valid comparison of prevalence of tobacco use among the categories of profession may be carried out.

5.4: Recommendations.

Base on the findings of the study, the following recommendations is made:

- Further research is needed to establish the reason behind the high rate of prevalence of tobacco use among healthcare professionals.
- Further research can be conducted to establish the factors associated with successful cessation of tobacco use among the healthcare professionals.
- Further research is needed to establish the effectiveness of tobacco cessation initiatives conducted by healthcare professionals.
- A further study that aims to investigate the causative factors of high rate of prevalence of smokeless tobacco use among nurses in Mizoram may be conducted.
- A study may be conducted to identify the factors contributing to successful cessation of tobacco use among previous tobacco users.

5.5: Summary.

The prevalence of tobacco use among healthcare professionals in the study is 47.2% of which smokers are 9.2%, smokeless tobacco users 34% and both smoking and smokeless 4%. There is a statistically significant difference ($p<0.05$) in the prevalence of tobacco use across different healthcare professionals. The mean of tobacco use prevalence is highest among the pharmacist and lowest among the nurses.

The frequency difference on how soon the participants smoked his/her first cigarette after waking up is statistically significant ($p<0.01$; highest during 0–5 mins and 31–60 mins (9; 16.1%), lowest during 6–30 mins (8; 14.3%).

The healthcare professionals smoking habits revealed that the amount of cigarette smoked per day is highest for 10 or less (40; 71.4%) and lowest for 21–30 cigarettes, and this frequency distribution is also statistically significantly different ($p<0.001$), a total of 47 (83.9%) participants want to stop smoking cigarette now while 9 (16.1%) of them did not want to stop smoking, and the frequency difference is statistically significant ($p<0.001$) a total of 34 (60.7%) have tried to stop smoking cigarettes during the past year, while 22 (39.3%) have never been trying to stop

smoking during the past years, and the frequency difference is also statistically significant ($p<0.001$).

Regarding the attitude towards tobacco use the mean rank on attitude towards tobacco use is highest in dentists (278.0) and lowest in doctors (197.97).

Prevalence of tobacco use have a statistically significant association with attitudes ($p<0.001$). Those who do not use tobacco in any form has stronger association with attitude than those who use tobacco, those who are >30 years has stronger association with attitude compared to other age group, those who did not smoke a single cigarette during the past 30 days and those who used smokeless tobacco 1-2 days during the past 30 days has stronger association with attitude compared to other group. Socio-demographic characteristics and attitude towards tobacco use is having a statistically significant association ($p<0.001$). Age group of 30-39 has stronger association with attitude compared to other age groups. Gender is having a statistically significant association with attitude ($p<0.001$). Male contributes 82.4% (inertia value =0.824) of the chi-square statistics and has stronger association with attitude compared to female. Divorced participants have stronger association with attitude compared to other marital status group. Family type is having a statistically significant association with attitude ($p<0.001$). Nuclear family contributes 35.4% (inertia value =0.824) of the chi-square statistics and has stronger association with attitude compared to other family types. Food habit is also having a statistically significant association with attitude ($p<0.001$). Vegan contributes 76.9% (inertia value =0.769) of the chi-square has stronger association with attitude compared to non-vegetarians and vegetarians. The five different healthcare professions studied is also having a statistically significant association with attitude ($p<0.001$). Doctors contributes 55.3 % (inertia value =0.553) of the chi-square has stronger association with attitude compared to other professions.

There is significant association between the prevalence of tobacco use and socio-demographic characteristics. Forms of tobacco use is associated with socio-demographic characteristics such as age group ($p<0.001$), gender ($p<0.001$), marital status ($p<0.001$), profession ($p<0.001$) and work experience ($p<0.01$). Age when

cigarette was tried for the first time is associated with demographic characteristics such as, age group ($p<0.01$) and food habit ($p<0.05$). Ever used smokeless tobacco such as paan masala, zarda, gutkha,khaini, paan or tubur (tobacco brew)is associated with demographic characteristics such as, religion ($p<0.05$) and marital status ($p<0.01$). Number of days smokeless tobacco is used in the past 30 days is associated with demographic characteristics such as, age group ($p<0.001$), religion ($p<0.05$), marital status ($p<0.05$), food habit ($p<0.05$) and work experience ($p<0.05$).Whether smokeless tobacco is used in hospital/Clinic/Institute/Sub center's premises during the past year is associated with demographic characteristics such as, age group ($p<0.001$), gender ($p<0.001$) and marital status ($p<0.001$). Whether the participants smoked cigarette in hospital/Clinic/Institute/Sub center's premises during the past year is associated with demographic characteristics such as, food habit ($p<0.001$) and work experience ($p<0.01$).

Ever tried for experimented with cigarette smoking even one or two puffs is associated with demographic characteristics such as, age group ($p<0.01$) and food habit ($p<0.01$). Number of days of smoking cigarette in the past 30 days is associated with demographic characteristics such as, age group ($p<0.001$), religion ($p<0.01$), food habit ($p<0.01$) and work experience ($p<0.05$).

Variables such as gender, age, professions, tobacco use cessation and exposure to environmental tobacco smoke (independent variable) statistically significantly predicted tobacco use habits (dependent variable) $p<0.001$. Variables such as family, food habits and training on tobacco (independent variable) statistically significantly predicted attitude towards tobacco use (dependent variable) ($p<0.05$).

5.6: Conclusion.

Tobacco use prevalence among the healthcare professionals in Mizoram is high. The habits indicate need for assistance in cessation. There is a discrepancy in training received regarding tobacco by the healthcare professionals during the course

of study. Non users of tobacco have better attitude than users of tobacco. Therefore, it is necessary to provide ongoing medical education on tobacco use cessation to all healthcare professionals with the goal of enhancing their knowledge, altering their attitudes, and fostering better practices. Healthcare professionals should be given access to tobacco cessation programs in order to lower the prevalence of tobacco use among them and establish themselves as positive role models for their communities. Healthcare professionals should be required to complete tobacco use cessation courses as part of their education. We must take into account that demographic characteristics such as gender, age, professions, tobacco use cessation and exposure to environmental tobacco smoke are predictors of tobacco use habits and also family, food habits and training on tobacco have strong association with attitude towards tobacco and make good use of these information while planning for tobacco cessation campaign.

APPENDICES

A_1: PERMISSION FROM HUMAN ETHICS COMMITTEE, MZU

Human Ethics Committee
MIZORAM UNIVERSITY
A Central University
(Accredited by NAAC with "A Grade")
Aizawl - 796 004, Mizoram, India

No. MZU/ HEC/ 2022/002

Dated: 08.03.2022

To
C. Lalramdini
College of Nursing
RIPANS, Zemabawk
Aizawl, Mizoram

The Human Ethics Committee in its meeting held on 05.03.2022 has reviewed and discussed your application to conduct the project entitled; "**Prevalence, Habits and Attitude towards Tobacco use among Health Care Professionals ".**

The following documents were reviewed:

a. Proposal for Ethics Committee and trial protocol (including protocol amendments)/ project.
b. Participant/ Patient Information Sheet and Informed Consent Form (including updates if any) in, English and/ or vernacular language.
c. Current CV of investigator(s).
d. Insurance Policy/Compensation for participation and for serious adverse events occurring during the study participation, if any.
e. DCGI/DBT/BARC/ Hospital/ Centre approval letter/submission letter, if any.

Decision of Committee: **Approved**

Member Secretary
Institutional Human Ethics Committee
MZU

Chairman
Institutional Human Ethics Committee
MZU
(DR. JOHN ZOHMINGTHANGA)
MBBS, MD (Path)
Dy. Medical Superintendent
Civil Hospital, Aizawl : Mizoram
Regn. No. MCI-6514

B_1: LETTER SEEKING EXPERT'S OPINION AND SUGGESTIONS FOR THE CONTENT VALIDITY OF THE TOOLS

Dear Sir/Madam,

Greetings

I am a Ph.D. Research Scholar in Nursing, under Mizoram University, Aizawl, Mizoram currently working on my research entitled "Prevalence, habits and attitude towards tobacco use among health care professionals." Under the supervision of Dr.HT Lalremsanga and Dr Lukima Saikia.

A self-administered questionnaire as instrument namely "Healthcare Professional Survey on Tobacco (HPST)" which is a modified questionnaire from Global Healthcare Professional Student Survey (GHPSS), will be used in the said research. In view with this the researcher would like your expertise to validate the attached structured questionnaire to qualify for conduction of the research. Knowing your experience in the field of research and expertise in the subject, I would like to ask for your help in validating the said instrument before administering it to the participants of this study.

I have attached here with the following:

1) Questionnaire for validation
2) Validation sheet
3) Statement of the problem and objective of the study with a little background of the process for preparation of the structured questionnaire
4) Certification of tool validation format

I will be glad to hear your suggestions and comments for the improvement of the instrument.

I am looking forward that my request would merit your positive response. Your positive response is highly anticipated and appreciated.

Thanking you.

Your Sincerely,

(C. LALRAMDINI)
Ph.D., Scholar in Nursing
Mizoram University, Aizawl Mizoram
Phone: 9436152891
Email: chenkualdidini@gmail.com

B_2: SAMPLE CERTIFICATE FOR CONTENT VALIDATION

CERTIFICATE OF VALIDATION

This is to certify that the instrument "Health Professional Survey on Tobacco (HPST)" prepared by C.Lalramdini, Ph.D. Scholar of Mizoram University, had undergone validation by me. I can attest that the questionnaire had passed through careful examination and were proven useful for the thesis entitled: "**Prevalence, habits and attitude towards tobacco use among health care professionals**."

CERTIFIED BY:

Signature :

Name :

Designation :

B_3: CRITERIA CHECK LIST FOR VALIDATION OF RESEARCH TOOL

Evaluation check list for content validation of a structured questionnaire prepared for conducting a research project:

Title: Prevalence, habits and attitude towards tobacco use among health care professionals.

Respected Sir/Madam,

Kindly give your expert opinion and suggestion on the basis of mentioned criteria. Kindly put a tick mark in the column provided against each section of the tool.

Healthcare Professional Survey on Tobacco (HPST)

PART: I DEMOGRAPHICS

Section of the tool	Adequate	Relevant	Accurate	To be added	To be omitted	Remark
a) Age in years						
b) Gender						
c) Religion						
d) Marital Status						
e) Family						
f) Food habit						
g) Profession						
h) Experience in years						
i) Type of organisation in which you are employed						

PART-II TOBACCO USE PREVALENCE

Section of the tool Question no: -	Adequate	Relevant	Accurate	To be added	To be omitted	Remark
1.						
2.(a)						
2.(b)						
3.						
4.						
5.(a)						
5.(b)						
6.						

PART-III EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE

Section of the tool Question no:	Adequate	Relevant	Accurate	To be added	To be omitted	Remark
7.						
8.						
9.						
10.						

PART-IV HABITS AND CESSATION

Section of the tool Question no:	Adequate	Relevant	Accurate	To be added	To be omitted	Remark
11						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						
21.						

PART-V CURRICULUM/TRAINING

Section of the tool Question no:	Adequate	Relevant	Accurate	To be added	To be omitted	Remark
22.						
23.						
24.						
25.						
26.						
27.						
28.						

PART VI: ATTITUDE

Section of the tool Question no:	Adequate	Relevant	Accurate	To be added	To be omitted	Remark
29.						
30.						
31.						
32.						
33.						
34.						
35.						
36.						
37.						
38.						
39.						
40.						
41.						
42.						
43.						
44.						
45.						
46.						
47						
48.						
49.						
50.						
51.						
52.						

Comments and suggestions:

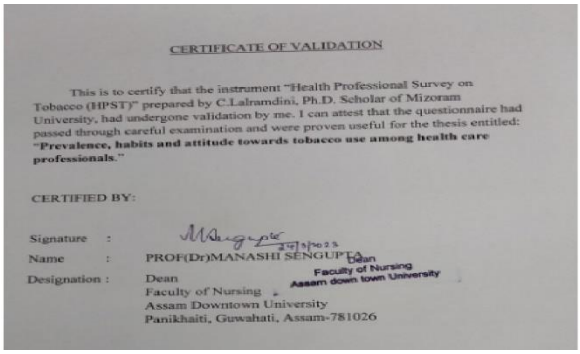
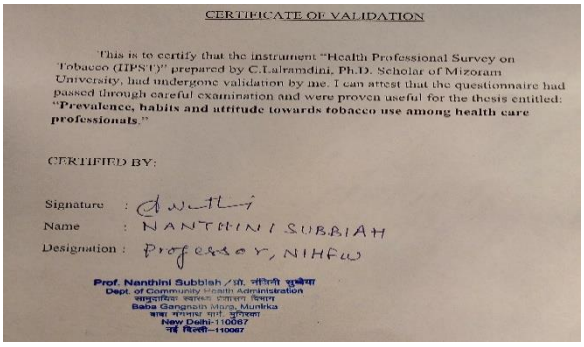
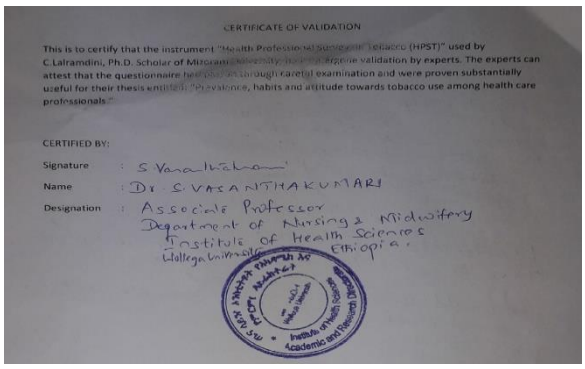
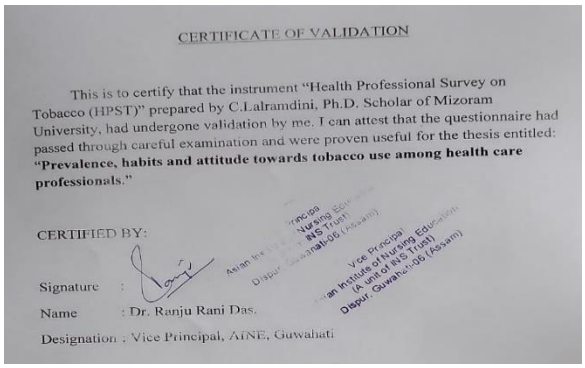
Signature of validator:

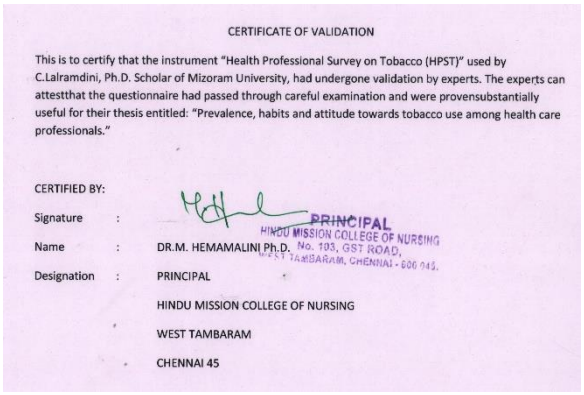
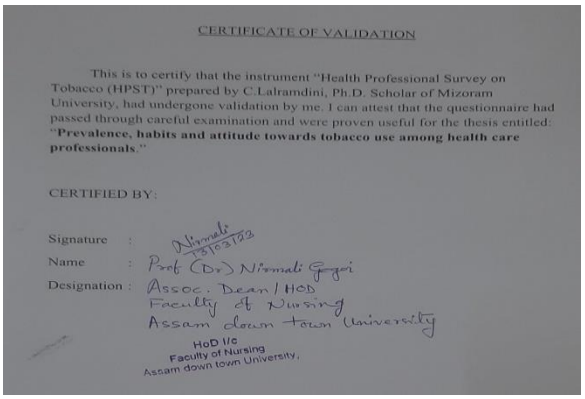
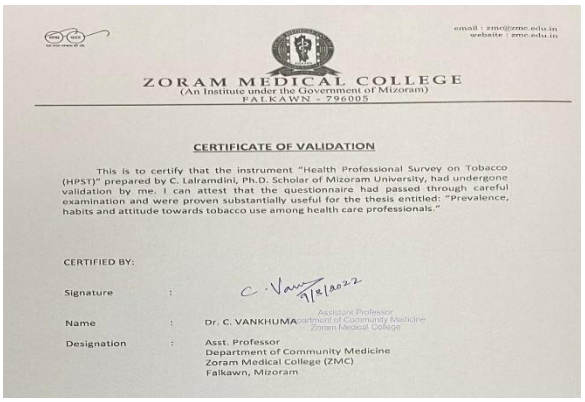
Name :

Designation :

B4: LIST OF EXPERTS FOR CONTENT VALIDITY OF TOOLS

Prof (Dr.) Swati M Patki **Dean & Professor** **Community Medicine** **Zoram Medical College,** **Falkawn,** **Mizoram-796005**	CERTIFICATE OF VALIDATION This is to certify that the instrument "Health Professional Survey on Tobacco (HPST)" used by C. Lalramdini, Ph.D. Scholar of Mizoram University, had undergone validation by experts. We attest that the questionnaire had passed through careful examination and were proven substantially useful for their thesis entitled: "Prevalence, habits and attitude towards tobacco use among health care professionals." CERTIFIED BY: Signature : Swati Name : Prof (Dr) Swati M Patki Designation : DEAN & Professor of Community Medicine, Zoram Medical College, Falkawn, Mizoram-796005
Dr. Manoj B Patki **Associate Professor** **Community Medicine** **Zoram Medical College,** **Falkawn,** **Mizoram-796005**	CERTIFICATE OF VALIDATION This is to certify that the instrument "Health Professional Survey on Tobacco (HPST)" used by C.Lalramdini, Ph.D. Scholar of Mizoram University, had undergone validation by experts. The experts can attest that the questionnaire had passed through careful examination and were proven substantially useful for their thesis entitled: "Prevalence, habits and attitude towards tobacco use among health care professionals." CERTIFIED BY: Signature : Name : Dr Manoj B Patki Designation : Associate Professor Community Medicine, Zoram medical College, Falkawn, Dist. Aizawl, Mizoram
Dr.Vanlalruatfela Hlondo **Asst. Professor** **Department of Education** **Mizoram University** **Tanhril, Mizoram**	CERTIFICATE OF VALIDATION This is to certify that the instrument "Health Professional Survey on Tobacco (HPST)" prepared by C.Lalramdini, Ph.D. Scholar of Mizoram University, had undergone validation by me. I can attest that the questionnaire had passed through careful examination and were proven useful for the thesis entitled: "**Prevalence, habits and attitude towards tobacco use among health care professionals**." CERTIFIED BY: Signature : 27/3/23 Name : DR. VANLALRUATFELA HLONDO Designation : Asst. Professor Department of Education Mizoram University Tanhril, Mizoram

Prof (Dr.) Manashi Sengupta **Dean,Faculty of Nursing.** **Assam Downtown University** **Panikhaiti, Guwahati, Assam-781026**	 CERTIFICATE OF VALIDATION This is to certify that the instrument "Health Professional Survey on Tobacco (HPST)" prepared by C.Lalramdini, Ph.D. Scholar of Mizoram University, had undergone validation by me. I can attest that the questionnaire had passed through careful examination and were proven useful for the thesis entitled: **"Prevalence, habits and attitude towards tobacco use among health care professionals."** CERTIFIED BY: Signature : Name : PROF(Dr)MANASHI SENGUPTA Designation : Dean Faculty of Nursing Assam Downtown University Panikhaiti, Guwahati, Assam-781026 Dean Faculty of Nursing Assam down town University
Prof (Dr) Nanthini Subbiah **Department of Community Health Administration** **Baba Gangnath Marg.Munirka** **Delhi-110067**	 CERTIFICATE OF VALIDATION This is to certify that the instrument "Health Professional Survey on Tobacco (HPST)" prepared by C.Lalramdini, Ph.D. Scholar of Mizoram University, had undergone validation by me. I can attest that the questionnaire had passed through careful examination and were proven useful for the thesis entitled: **"Prevalence, habits and attitude towards tobacco use among health care professionals."** CERTIFIED BY: Signature : Name : NANTHINI SUBBIAH Designation : Professor, NIHFW Prof. Nanthini Subbiah Dept. of Community Health Administration Baba Gangnath Marg, Munirka New Delhi-110067
Dr.S.Vasantha Kumari **Dept. of Nursing and Midwifery** **Institute of Health Sciences** **Wallega University, Ethiopia**	 CERTIFICATE OF VALIDATION This is to certify that the instrument "Health Professional Survey on Tobacco (HPST)" used by C.Lalramdini, Ph.D. Scholar of Mizoram University, for content validation by experts. The experts can attest that the questionnaire had undergone through careful examination and were proven substantially useful for their thesis entitled "Prevalence, habits and attitude towards tobacco use among health care professionals." CERTIFIED BY: Signature : Name : Dr. S.VASANTHAKUMARI Designation : Associate Professor Department of Nursing & Midwifery Institute of Health Sciences Wallega University, Ethiopia.
Dr.Ranju Rani Das **Vice Principal** **Asian Institute of Nursing Education** **Dispur, Guwahati-6 Assam**	 CERTIFICATE OF VALIDATION This is to certify that the instrument "Health Professional Survey on Tobacco (HPST)" prepared by C.Lalramdini, Ph.D. Scholar of Mizoram University, had undergone validation by me. I can attest that the questionnaire had passed through careful examination and were proven useful for the thesis entitled: **"Prevalence, habits and attitude towards tobacco use among health care professionals."** CERTIFIED BY: Signature : Name : Dr. Ranju Rani Das. Designation : Vice Principal, AINE, Guwahati Vice Principal Asian Institute of Nursing Education (A unit of RIS Trust) Dispur, Guwahati-06 (Assam)

Dr.M.Hemamalini **Principal** **Hindu Mission College of Nursing** **West Tambaram** **Chennai 45**	 CERTIFICATE OF VALIDATION This is to certify that the instrument "Health Professional Survey on Tobacco (HPST)" used by C.Lalramdini, Ph.D. Scholar of Mizoram University, had undergone validation by experts. The experts can attestthat the questionnaire had passed through careful examination and were provensubstantially useful for their thesis entitled: "Prevalence, habits and attitude towards tobacco use among health care professionals." CERTIFIED BY: Signature : Name : DR.M. HEMAMALINI Ph.D. Designation : PRINCIPAL HINDU MISSION COLLEGE OF NURSING WEST TAMBARAM CHENNAI 45 PRINCIPAL HINDU MISSION COLLEGE OF NURSING No. 193, GST ROAD, WEST TAMBARAM, CHENNAI - 600 045.
Prof (Dr) Nirmali Gogoi **Assoc. Dean/HOD** **Faculty of Nursing** **Assam Downtown University** **Panikhaiti, Guwahati,** **Assam-781026**	 CERTIFICATE OF VALIDATION This is to certify that the instrument "Health Professional Survey on Tobacco (HPST)" prepared by C.Lalramdini, Ph.D. Scholar of Mizoram University, had undergone validation by me. I can attest that the questionnaire had passed through careful examination and were proven useful for the thesis entitled: "**Prevalence, habits and attitude towards tobacco use among health care professionals.**" CERTIFIED BY: Signature : Name : Prof (Dr.) Nirmali Gogoi Designation : Assoc. Dean / HOD Faculty of Nursing Assam down town University HoD I/c Faculty of Nursing Assam down town University,
Dr. C.Vankhuma **Asst.Professor** **Dept.of Community Medicine** **Zoram Medical College,** **Falkawn,** **Mizoram-796005**	 email : zmc@zmc.edu.in website : zmc.edu.in ZORAM MEDICAL COLLEGE (An Institute under the Government of Mizoram) FALKAWN - 796005 CERTIFICATE OF VALIDATION This is to certify that the instrument "Health Professional Survey on Tobacco (HPST)" prepared by C. Lalramdini, Ph.D. Scholar of Mizoram University, had undergone validation by me. I can attest that the questionnaire had passed through careful examination and were proven substantially useful for the thesis entitled: "Prevalence, habits and attitude towards tobacco use among health care professionals." CERTIFIED BY: Signature : Name : Dr. C. VANKHUMA Designation : Asst. Professor Department of Community Medicine Zoram Medical College (ZMC) Falkawn, Mizoram Assistant Professor Department of Community Medicine Zoram Medical College

B_5: SAMPLE DATA COLLECTION TOOL- STRUCTURED QUESTIONNAIRE WITH CODING KEY

Prevalence, habits and attitude towards tobacco use among health care professionals.

Dear Health Care Professional,

You are requested to participate in this research which aims to find out the prevalence, habits and personnel attitude of health care professionals towards tobacco use. The data collected from this questionnaire will be used for research and publication purposes only. The name and identity of the respondents will be kept confidential. The questionnaire will take approximately 10-15 minutes to complete.

Your participation is voluntary. Under no circumstances are you obliged to answer any of the questions, however, in doing so you will greatly assist me in completing my research and enhancing the understanding of this research focus.

If you are voluntarily willing to participate in the study by taking the survey, please check the questions given below and proceed to answering them. Thank you for taking the time in assisting me with this research.

Sincerely,

Name: C. Lalramdini
Ph.D Scholar in Nursing
Department of Zoology (Nursing)
Mizoram University, Aizawl, Mizoram
Supervisors: Dr.H.T Lalremsanga and Dr.Lukima Saikia.

Healthcare Professional Survey on Tobacco (HPST)

PART-I: DEMOGRAPHICS

Instruction: Please complete this section by filling in the space given or by ticking the most appropriate option given.

a) Age in years	:	18-29 30-39 40-49 50-59 60>
b) Gender	:	Male/Female/Transgender
c) Religion	:	Hindu/Christian/Muslim/Others
d) Marital Status	:	Single/Married/Widowed/Divorced/Separated
e) Family	:	Nuclear/Joint/Extended
f) Food habit	:	Vegetarian/Non vegetarian/Vegan
g) Profession	:	Doctor/Dentist/Nurse/ Pharmacist / Multipurpose Health Worker
h) Experience in years	:	_____
i)Type of Organization in which you are employed:		Government/Private/Mission/NGO

Please give your response to the following Questions on Health Professional Survey on Tobacco (HPST) which is a modified WHO standard tool on Global Health Professional Students Survey (GHPSS).

PART-II: TOBACCO USE PREVALENCE:

1.In what form do you currently use tobacco?

a) Smoking
b) Smokeless
c) Both smoking and smokeless
d) I do not use tobacco in any form.

2.(a)Have you ever tried or experiment with cigarette smoking even one or two puffs?

a) Yes
b) No

2.(b)I yes. How old were you when you first tried a cigarette?

a) Age 10 or younger
b) Age 11-15
c) Age 16-17
d) Age 18-19
e) Age 20-29
f) Age 30 or older
g) I have never tried a cigarette

3. For current smokers: During the past 30 days (one month), on how many days did you smoke cigarettes?

a) 0 day
b) 1 or 2 days
c) 3 to 5 days
d) 6 to 9 days
e) 10 to 19 days
f) 20 to 29 days
g) All 30 days
h) Not applicable (I do not currently smoke cigarettes)

4. For current smokers: Have you smoked cigarettes on hospital/Clinic/Institute/Sub center premises during the past year?

a) Not applicable (I do not currently smoke cigarettes)
b) Yes
c) No

5.(a) Have you ever used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew)?

a) Yes
b) No

5.(b) If yes, During the past 30 days (one month), on how many days did you use smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew)?

a) 1 or 2 days
b) 3 to 5 days
c) 6 to 9 days
d) 10 to 19 days
e) 20 to 29 days
f) All 30 days
g) Not applicable (I do not currently use any smokeless tobacco)

6. For smokeless tobacco users: Have you used smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) in hospital/Clinic/Institute/Sub center's premises during the past year?

a) Not applicable (I do not currently use any smokeless tobacco)
b) Yes
c) No

PART-III: EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE

7. During the past 7 days, on how many days have people smoked inside your home, in your presence?

a) 0 day
b) 1 to 2 days
c) 3 to 4 days
d) 5 to 6 days
e) All 7 days

8. During the past 7 days, on how many days have people smoked in your presence, in places other than where you live?

a) 0 day
b) 1 to 2 days
c) 3 to 4 days

d) 5 to 6 days
e) All 7 days

9. Does your hospital/clinic/Institute /Sub center/organization have an official policy banning smoking at work place?

a) Yes,
b) No official policy

10. Is your hospital/clinic/Institute /Sub center/organization's official smoking ban at work place enforced?

a) Yes, policy is enforced
b) No, policy is not enforced
c) No official policy

IV. HABITS AND CESSATION: (For smoking & smokeless tobacco users)

11. How soon after you wake up do you smoke your first cigarette?

a) I have never smoked cigarettes
b) I do not currently smoke cigarettes
c) 0-5 minutes
d) 6-30 minutes
e) 31-60 minutes
f) After 60 minutes

12. How soon after you wake up do you use your first smokeless tobacco?

a) I have never used smokeless tobacco
b) I do not currently use any smokeless tobacco
c) 0-5 minutes
d) 6-30 minutes
e) 31-60 minutes
f) After 60 minutes

13. Do you find it difficult to refrain from smoking/use of smokeless tobacco in places where it is forbidden (eg. Church, library, cinema etc).

a) Yes
b) No

c) Not applicable (I do not currently smoke or use smokeless tobacco)

14. How many cigarettes per day do you smoke?

a) 10 or Less
b) 11-20
c) 21-30
d) 31 or more
e) Not applicable (I do not currently smoke cigarettes)

15. Do you smoke/ use smokeless tobacco more frequently during the first hours after waking than during the rest of the day?

a) Yes
b) No
c) Not applicable (I do not currently smoke or use smokeless tobacco)

16. Do you smoke/ use smokeless tobacco even when you are so ill that you are in bed most of the day?

a) Yes
b) No
c) Not applicable (I do not currently smoke or use smokeless tobacco)

17. Do you want to stop smoking cigarettes now?

a) Yes
b) No
c) Not applicable (I do not currently smoke cigarettes)

18. During the past year, have you ever tried to stop smoking cigarettes?

a) Yes
b) No
c) Not applicable (I do not currently smoke cigarettes)

19. For participants who were past-smokers and stopped smoking: How long ago did you stop smoking cigarettes?

a) I have not stopped smoking cigarettes
b) Less than 1 month

c) 1 – 5 months
d) 6 – 11 months
e) One year
f) 2 years
g) 3 years or longer
h) Not applicable (I am neither a current smoker or past-smoker)

20. Have you ever received help or advice to help you stop smoking cigarettes?

a) Not applicable (I am neither a current smoker or past-smoker)
b) Yes
c) No

21. Do you want to stop using smokeless tobacco such as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew)?

a) Yes
b) No
c) Not applicable (I do not currently use smokeless tobacco)

PART-V: CURRICULUM/TRAINING

22. During your (medical, dental, nursing, pharmacy, health worker) school training, were you taught in any of your class about the dangers of smoking/using smokeless tobacco?

a) Yes
b) No

23. During your (medical, dental, nursing, pharmacy, health worker) school training, did you discuss in any of your classes the reasons why people smoke/use smokeless tobacco?

a) Yes
b) No

24. During your (medical, dental, nursing, pharmacy, health worker) school training, did you learn that it is important to record tobacco use history as a part of patients' general history?

a) Yes

b) No

25. During your (medical, dental, nursing, pharmacy, health worker) school training, have you ever received any formal training in tobacco cessation approaches to use with patients?

a) Yes

b) No

26. During your (medical, dental, nursing, pharmacy, health worker) school training, did you learn that it is important to provide educational materials to support tobacco cessation to patients who want to quit smoking/ smokeless tobacco use?

a) Yes

b) No

27. Have you ever heard of using nicotine replacement therapies in tobacco cessation programs (such as nicotine patch or gum)?

a) Yes

b) No

28. Have you ever heard of using antidepressants in tobacco cessation programs (such as bupropion or Zyban)?

a) Yes

b) No

PART VI: ATTITUDE:

Below is a list of statements aimed to study the attitude of health care professionals towards tobacco use. Please put a tick mark (□) on any one of the five boxes given on the right side of each statement which best reflect your feeling/opinion regarding the statement.

Sl. No.	Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
29	*Smoking is harmful to health*					
30	*Second-hand smoking is harmful to health even for non-smokers*					
31	*Smokeless tobacco use is harmful to health*					
32	*Smoking ban act is fair to the non-smokers*					
33	*Smoking ban act is fair to the*					

	smokers					
34	*Tobacco sales to adolescent should be banned*					
35	*Policies on cessation of smoking should be implemented in the health care setting*					
36	*One should be cautious about smoking in presence of non-smokers*					
37	*One should be cautious about use of smokeless tobacco in presence of non-users*					
38	*Health care professionals should not smoke in the presence of children*					
39	*Health care professionals should not practice use of smokeless tobacco in the presence of children*					
40	*It is the responsibility of Health care professionals to warn the smokers of the harmful effects of smoking*					
41	*It is the responsibility of Health care professionals to warn the smokeless tobacco user of the harmful effects of tobacco use.*					
42	*It is the responsibility of Health care professionals to warn pregnant women the harmful effects smoking has on the fetus*					
43	*It is the responsibility of Health care professionals to warn pregnant women the harmful effects use of smokeless tobacco has on the fetus*					
44	*Health care professionals are "role models' for their patients and public*					
45	*Health care professionals should routinely advise patients to stop smoking*					
46	*Health care professionals should routinely advise patients to stop using smokeless tobacco products.*					
47	*Health care professionals have a greater responsibility towards the harmful effects of tobacco use*					
48	*Health care professionals should attend specific training on tobacco cessation techniques*					
49	*Health care organizations should establish tobacco cessation clinic*					
50	*The chances of patients quitting tobacco use increase if a health*					

	care professional advises him/her					
51	*Health care professionals who are themselves smokers are less likely to advise patients to stop smoking*					
52	*Health care professionals who themselves use smokeless tobacco such as as paan masala, zarda, gutkha, khaini, paan or tuibur (tobacco brew) are less likely to advise patients to stop using smokeless tobacco products.*					

I. DEMOGRAPHIC CHARACTERSITICS.

VARIABLES	RESPONSE	CODE
Age	18-29	1
	30-39	2
	40-49	3
	50-59	4
Gender	Female	1
	Male	2
Religion	Christian	1
	Hindu	2
		3
	etc.. Etc..	4
Marital status	Single	1
	Married	2
	Divorced	3
	Widowed	4
Family type	Extended	1
	Joint	2
	Nuclear	3
Food habits	Non-vegetarian	1
	Vegetarian	2
	Vegan	3
Profession	Doctor	1
	Dentist	2
	Nurse	3
	Pharmacist	4
	MHW	5
Organization	Government	1
	Mission	2
	Private	3
	NGO	4

II. TOBACCO USE PREVALENCE.

QUESTIONS	RESPONSE	CODE
1	Smoking	1
	Smokeless	2
	Both	3
	I do not use tobacco in any form	0
2a	Yes	1
	No	0
2b	<10	1
	11-15	2
	16-17	3
	18-19	4
	20-29	5
	>30	6
	I have never tried a cigarette	0
3	0 day	1
	1-2	2
	3-5	3
	6-9	4
	10-19	5
	20-29	6
	All 30 days	7
	N/A: I do not currently smoke cigarettes	0
4	N/A: I do not currently smoke cigarettes	0
	Yes	1
	No	2
5a	Yes	1
	No	0
5b	1-2	2
	3-5	3
	6-9	4
	10-19	5
	20-29	6
	All 30 days	7
	N/A: I do not currently smoke cigarettes	0
6	N/A: I do not currently smoke cigarettes	0
	Yes	1
	No	2

III. EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE.

QUESTIONS	RESPONSE	CODE
7	0 day	0
	1-2	1
	3-4	2
	5-6	3
	All 7 days	4
8	0 day	0
	1-2	1
	3-4	2
	5-6	3
	All 7 days	4
9	Yes	1
	No	0
10	Yes	1
	No	2
	No official policy	0

IV. HABITS AND CESSATION.

QUESTIONS	RESPONSE	CODE
11	I have never smoked cigarettes	0
	I do not currently smoke cigarettes	1
	0-5mins	2
	6-30mins	3
	31-60mins	4
	>60mins	5
12	I have never used smokeless tobacco	0
	I do not currently use smokeless tobacco	1
	0-5mins	2
	6-30mins	3
	31-60mins	4
	>60mins	5
13	Yes	1
	No	2
	Not applicable	0
14	<10	1
	11-20	2
	21-30	3
	31 or more	4
	Not applicable	0
15	Yes	1

	No	2
	Not applicable	0
16, 17,18, 20,21	Yes	1
	No	2
	Not applicable	0
19	I have not stopped smoking	1
	<1 month	2
	1-5months	3
	6-11months	4
	1 year	5
	2 years	6
	3 years or longer	7
	Not applicable	0

V. CURRICULUM TRAINING (Q22-28).

RESPONSE	CODE
Yes	1
No	0

VI. ATTITUDE (Q29-52).

RESPONSE	CODE
Strongly agree	5
Agree	4
Undecided	3
Disagree	2
Strongly disagree	1

B_6: SAMPLE INFORMED CONSENT FORM

TITLE OF STUDY: Prevalence, habits and attitude towards tobacco use among health care professionals.

INVESTIGATOR

C.Lalramdini, PhD. Scholar in Nursing, Mizoram University, Aizawl, Mizoram
Phone no: 9436152891 Email: chenkualdidini@gmail.com

PURPOSE OF STUDY

You are being asked to take part in a research study titled 'Prevalence, habits and attitude towards tobacco use among health care professionals". This is a research project being conducted by Mrs.C.Lalramdini , Ph.D Scholar in Nursing at Mizoram University under the supervision of Dr.H.T Lalremsanga and Dr.Lukima Saikia. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please read the following information carefully. Please ask the researcher if there is anything that is not clear or if you need more information.

STUDY PROCEDURES

The research project will be conducted by introduction of a self-response questionnaire to the participants. The data collected from this questionnaire will be used for research and publication purposes only. The questionnaire will take approximately 10-20 minutes to complete.

RISKS

There are no foreseeable risks involved in participating in this research study, some of the questions maybe be unpleasant as it may relates with your personnel experiences. Therefore, you may decline to answer any or all questions and you may terminate your involvement at any time if you choose.

BENEFITS

There will be no direct benefit to you for your participation in this study. However, we hope that the information obtained from this study may greatly assist us in completing the research and enhancing the understanding of this research focus.

CONFIDENTIALITY

Your responses to this survey will be anonymous. Every effort will be made by the researcher to preserve your confidentiality by assigning code names/numbers for participants that will be used on all research notes and documents. Participant data will be kept confidential except in cases where the researcher is legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse and suicide risk.

CONTACT INFORMATION

If you have questions at any time about this study, or you experience adverse effects as the result of participating in this study, you may contact the researcher whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the Primary Investigator, please contact the research supervisors Dr.H.T.Lalremsanga via phone no 9862559482 email htremsanga@gmail.com or Dr.Lukima Saikia via phone no 9864172164 email lukimasaikia@gmail.com

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

TITLE OF STUDY: ***Prevalence, habits and attitude towards tobacco use among health care professionals.***

CONSENT

I have read and I understand the provided information and have had the opportunity to ask questions regarding the research project title mentioned above. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

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BRIEF BIODATA OF THE CANDIDATE

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Educational Qualifications:

EXAMS	BOARD	SUBJECT	PERCENTAGE	DIVISION	YEAR
HSLC	MBSE	General	66%	First	1988
P.U.Sc.	NEHU	Science	51.33%	Second	1991
B.Sc.N	Gauhati University	Nursing	66.19%	First	1995
M.Sc.N	SNDT Women's University	Nursing	66.29%	First	2002

PUBLICATIONS

1. Lalramdini C, Lalremsanaga HT,Saikia L,Malsawmtluanga HT.Perceived Stress and Coping Strategies among B.Sc.Nursing Students in Mizoram during Covid19 Pandemic.Indian J Psy Nsg 2024:21:10-6 **(UGC Care Listed Journal from July 2020 to present).**

2. Lalramdini C,Lalremsanga HT,Saikia L,Lalthanthuami HT. Prevalence and Attitudes on Tobacco Use among Nurses in Mizoram. Indian J Public Health 2024; 68:147-8 **(Scopus Indexed Journal).**

3. Lalramdini C,Lalremsanga HT,Saikia L,Lalthanthuami HT.(2024) A study on the Prevalence and Attitude on Tobacco Use Among Multipurpose Health Workers in Mizoram.The Journal of Medical Research ;10(2):45-49 **(Peer Reviewed Journal).**

4.Lalramdini C and Malsawmzuali (2024). Prevalence of Smokeless Tobacco use among School Children in Selected Schools of Mizoram. Health C Res Public Safety J, 5(1): 180036.

5.C.Lalramdini, H.T.Lalremsanga, Lukima Saikia,H.T.Lalthanthuami,Likhita Alajangi, Midhulasri Kukkapalli (2025). A Cross-Sectional Study on the Prevalence and Attitudes towards Tobacco Use among Healthcare Professionals in Mizoram. Indian Journal of Public Health Research and Development / Vol. 16 No. 1, January-March. **(Scopus Indexed Journal).**

PAPER PRESENTED

1. “Prevalence and Attitude on tobacco use among Nurses in Mizoram” in the National seminar on ‘Biotechnology for Sustainable Agriculture and Human Health” organised by the Department of Biotechnology, Pachhunga University College (PUC) Aizawl, India from 12-13 June 2023.

2. “Prevalence, habits and attitude towards tobacco use among Healthcare Professionals” in the National Seminar on Biotechnology for Sustainable Biosphere organised by the Department of Biotechnology, Mizoram University on the 30th June and 1st July 2023.

3. “Prevalence and attitude of tobacco use among Health Professionals” in the International Conference on Emerging Trends in Psychological Interventions (Health and Allied Sciences): Future Prospect and Challenges (RCI-Accredited). Organised by School of Medical and Paramedical Sciences, Mizoram University, from 14th November to 16th November 2023.

CONFERENCE/SEMINAR/WORKSHOP PARTICIPATED

1. ‘Training on Tobacco Cessation for Health Professionals’ conducted by National Tobacco Control Programme, National Health Mission, Mizoram Aizawl. On 23rd March 2021 at RIPANS.

2. Training Course on Management for Senior Nursing Administrators held at NIHFW New Delhi from 9th to 11th August 2021.

3. National workshop on Research Methodology and Statistics in Behavioural Science’ organized by IQAC, IASE from 21st to 25th February 2022.

4. National E-Conference on ‘Integration of Nursing Education and Competency-Based Clinical Practices Need of the Hour’ Organised by Smt. Radhikabai Meghe Memorial College of Nursing, Sawangi (Meghe), Wardha Maharashtra in collaboration with The Nursing Scholar Society on 24th & 25th February 2022.

5. ‘Educating Young Minds for Snakebite Management and Conservation of Snakes in Mizoram, India’ which was funded by The Rufford Foundation (UK) & International Herpetology Symposium (USA) and Organised by the

Department of Zoology, Mizoram University and Society for Nature Conservation Research and Community Engagement (CONCERN), in collaboration with College of Nursing RIPANS on 20th May 2022.

6. 'Workshop on Digitization of Office Documents' on 8th & 9th June 2022, at Computer Centre RIPANS.

7. Course Coordinator in the 8th Finishing School 2022 for B.Sc. Nursing Students held from 25th July to 29th July 2022 at RIPANS, Campus.

8. Coordinated Regional Training on Managing Programmes on Reproductive, Maternal, Newborn, Child, and Adolescent Health organized from 12th to 16th December 2022 at RIPANS, Aizawl, Mizoram in collaboration with WHO and NIHFW.

9. Coordinated a workshop on 'Professional Development for Staff Nurses' organized by 1st year M.Sc. Nursing Students, RIPANS from 27th to 31st March 2023 at RIPANS Campus, Aizawl, Mizoram

10. Course Coordinator in the 9th Finishing School 2023 for B.Sc. Nursing Students held from 24th July to 27th July 2023 at RIPANS, Campus.

11. 19th Biennial Conference & Election of the TNAI Mizoram State Branch held on 6th & 7th September 2023. Conference Theme 'The Future of Nursing: Leading Change, Advancing Health and Transforming Care'.

12. National Conference on 'Forensic Science; Moral, Ethical and Legal Responsibilities of Medical, Nursing and Paramedical Professionals' as a delegate, organized by Rahman Hospitals Pvt Ltd & Rahman Institute of Nursing and Paramedical Sciences on 28th November 2023 at Auditorium, Rahman Institute of Nursing and Paramedical Sciences, Guwahati.

13. Course Coordinator in the 10th Finishing School 2024 for B.Sc. Nursing Students held from 22nd July to 24th July 2024 at RIPANS, Campus.

14. National Level Continuing Nursing Education Programme with the theme 'Leading with Vision: Strategies for Effective Leadership in Nursing" organized by 2nd Year M.Sc. Nursing students of RIPANS on 7th June 2024 at RIPANS Conference Hall, Zemabawk, Aizawl, Mizoram.

15. Training Course on Management for Senior Nursing Administrators held at National Institute of Health and Family Welfare (NIHFW), New Delhi during 27th -31st August 2024.

PARTICULARS OF THE CANDIDATE

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DEGREE	: DOCTOR OF PHILOSOPHY
DEPARTMENT	: NURSING
TITLE OF THESIS	: Prevalence, habits and attitude towards tobacco use among health care professionals.
DATE OF ADMISSION	: 07.12.2020

APPROVAL OF RESEARCH PROPOSAL:

BOS	: 29.06.2021
SCHOOL BOARD LIFE SCIENCE	:10.05.2021
SCHOOL BOARD (SMPS)	**:**19.05.201
ACADEMIC COUNCIL	: 26.06.2021
MZU REGISTRATION NO	: 2006575
Ph. D. REGISTRATION NO. & DATE	: MZU/Ph.D./1658 of 07.12.2020

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ABSTRACT

PREVALENCE, HABITS AND ATTITUDE TOWARDS TOBACCO USE AMONG HEALTH CARE PROFESSIONALS

AN ABSTRACT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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ABSTRACT

PREVALENCE, HABITS AND ATTITUDE TOWARDS TOBACCO USE AMONG HEALTH CARE PROFESSIONALS

By

C.Lalramdini

Department of Nursing

Name of Supervisor

Prof.H.T.Lalremsanga

Name of Joint Supervisor

Dr.Lukima Saikia

Submitted

In partial fulfillment of the requirement of the Degree of Doctor of Philosophy in Nursing of Mizoram University, Aizawl

Organization of the report:

The current study's report is organised into five chapters for a systematic presentation.

Chapter I: INTRODUCTION

Chapter II: REVIEW OF LITERATURE

Chapter III: METHODOLOGY

Chapter IV: ANALYSIS AND INTERPRETATION

Chapter V: DISCUSSION, SUMMARY AND CONCLUSION

1.0: INTRODUCTION

1.1: Background of the study.

The world's leading preventable cause of mortality at the moment is tobacco usage. It already claims the lives of 5.4 million people annually, and by 2030, if unchecked, that figure could rise to almost 8 million. Due to the hazardous nature of tobacco in all its forms, there is no safe level of exposure. Cigarette smoking is the most common method of tobacco use. (WHO, 2009). The usage of smokeless tobacco is very unhealthy and addicting. Use of smokeless tobacco products raises the risk of certain dental disorders as well as malignancies of the oesophagus, pancreas, lungs, and oral cavity (including cancer of the mouth, tongue, lip, and gums). Smokeless tobacco products are a major source of carcinogenic nitrosamines (Boffeta et al. 2008).

Tobacco consumption is still on the rise in India. The continuous assessment of cigarette use trends will support the creation of effective tobacco control initiatives. Most large studies have limitations because of data that was submitted by a household member. Studies conducted in communities that gather information from every participant at different times will be a more reliable source of data for understanding trends (Mohan et al. 2018).

Government of Mizoram DP&PR (2022) stated that according to a combined ICMR-NCDIR survey, up to 77.1% of Mizoram residents use tobacco products, both

smoked and smokeless. The percentage of people who use smokeless tobacco is higher than that of smoked tobacco, at 54.1%, compared to 43.6 percent for smoked tobacco. Singh et al.'s 2010 study highlights a concerning state of affairs and urges medical professionals who also serve as social role models and health advocates to take prompt anti-tobacco and tobacco cessation measures. Concerns regarding tobacco control and cessation programs remain centered around the health of the public and the individual. The fight against tobacco can gain traction by focusing interventions on future medical professionals (Brar et al. 2020).

1.2: Need for the study.

Despite tobacco control policies, India's tobacco consumption is still rising. More prominent and forceful anti-tobacco programs are required, together with heightened public knowledge of the negative effects of tobacco use and active workplace and health professional involvement in encouraging tobacco cessation (Mohan et al. 2018). The results of a study by Juranic et al. (2017) showed a high prevalence of smokers among medical professionals, indicating the inadequacy of the current anti-tobacco strategy. Healthcare professionals should warn the public about the dangers of tobacco smoke because they do not fully understand the extent to which smoking harms both the smoker and others around them. Encouraging healthcare practitioners to participate in training programs will help them become more skilled in smoking cessation counseling techniques and empower them to actively assist their patients.

Throughout the world, a great deal of research has been done on tobacco-related topics among healthcare professionals, however, the researcher is not able to identify any research report related to healthcare professionals' tobacco use in Mizoram. Consequently, the investigator realized the necessity of carrying out research in this domain.

1.3: Statement of the problem.

Prevalence, habits, and attitude towards tobacco use among healthcare professionals.

1.4: Objective of the study.

1. To identify the prevalence of tobacco use among healthcare professionals.
2. To compare the prevalence of tobacco use among healthcare professionals.
3. To assess the habit of health care professionals on tobacco use.
4. To evaluate the attitude of health care professionals on tobacco use.
5. To inspect a relationship between the prevalence of tobacco use and attitude among health care professionals.
6. To find out the association between the attitude of health care professionals on tobacco use with their selected demographic variables.
7. To detect the association between the prevalence of tobacco use among healthcare professionals with their selected demographic variables.

1.5: Hypothesis:

H1 There is a significant relationship between the prevalence of tobacco use and attitude among healthcare professionals.

H2 There is a significant association between tobacco use prevalence among healthcare professionals and their selected demographic variables.

H3 There is a significant association between attitudes toward tobacco use among healthcare professionals and their selected demographic variables.

2.0: REVIEW OF LITERATURE.

This chapter deals with the review of related literature. A literature review is a thorough summary of earlier studies on a subject. The review should list, characterize, condense, impartially assess, and elucidate this earlier work. It ought to provide the research with a theoretical foundation and assist the author, in defining the scope of the investigation. A total of 46 related literature were reviewed in the following sections.

2.1: Tobacco use prevalence.

2.1.1: Global Tobacco use prevalence.

2.1.2: Prevalence of Tobacco use and attitudes among healthcare professionals.

2.1.3: Prevalence of Tobacco Use in Mizoram.

2.2: Hazards of Tobacco Use.

2.2.1: Hazards of Smoking.

2.2.2: Hazards of Second-hand Smoke.

2.2.3: Hazards of Smokeless Tobacco.

2.3: Tobacco Cessation and Health Care Professionals.

2.4: Tobacco-related laws and regulations.

2.4.1: Tobacco Control Laws (2023).

2.4.2: National Tobacco Control Program (NTCP).

2.4.3: WHO Framework Convention on Tobacco Control (WHO FCTC).

2.4.4: Government of Mizoram Ban Tobacco:

3.0: METHODOLOGY.

This chapter describes the methodology adopted for identifying the prevalence of tobacco use, comparing the prevalence among the various professions, assessing the habits, evaluating attitudes, establishing relationships between prevalence and attitude, detecting association between prevalence and demographic variables, and finding association between attitude and demographic variables towards tobacco use among the healthcare professionals.

3.1: Research design.

The research design chosen for this study was Cross-sectional Survey research design.

3.2: Research setting.

The setting chosen for the study is Aizawl District, Mizoram.

3.3: Population.

The population for the study is healthcare professionals residing in Mizoram.

3.4: Target population.

Healthcare professionals particularly those in Mizoram who are employed as Doctors, Nurses, Dentists, Pharmacists, and Multipurpose Health Workers currently working in Mizoram are the target population.

3.5: Inclusion criteria.

Health Care Professional who is:

1) A doctor, nurse, dentist, pharmacist, and health workers
2) Presently in service.
3) Working within the Aizawl District.

3.6: Exclusion criteria.

1) Health Care Professionals who are chronically ill.
2) Health Care Professional who was in service for less than one year.

3.7: Sampling technique.

A combination of the Proportionate Stratified Sampling technique and convenience sampling is used.

3.8: Sample size.

The total population identified is 7947. The sampling process is initiated first by calculating the sample size using Slovin's Formula. From the entire population with 95% Confidence level and 5% Margin error the sample size required is identified as 367.

$n = N / (1 + Ne2)$.

To ensure a representative sample from different facets of the target population, this study used a proportionate stratified random sampling approach. The first step involved stratifying the population (healthcare professionals) into five strata based on the professions such as doctors, dentists, nurses, pharmacists and MPHWs.

For determining the required sample size within each stratum, the following formula is employed to allocate proportional to stratum size.

$$\text{ni} = n\left(\frac{Ni}{N}\right)$$

where, n is the total number of sample units available for allocation, Ni is the size of each stratum, N is the size of the entire population and ni is the number of sample units to allocate to stratum i.

The sample size formula adopted determined a sample size of as follows:

STRATUM	DOCTORS	DENTIST	NURSES	PHARMACIST	MPHW	TOTAL
Population size	868	250	4460	642	1727	7947
Sample Size	40	12	205	30	80	367

3.9: Tools and techniques.

The Healthcare Professionals Survey on Tobacco (HPST), a structured questionnaire, that was prepared specifically for this study, was the instrument used to collect data for the study.

3.10: Development of the tool.

The data collection tool was modified from the Global Health Professions Student Survey (GPHSS) and developed based on an extensive literature review using the Delphi method from experts in the field.

3.11: Description of the tool.

The prepared data collection tool is a structured questionnaire named 'Healthcare Professionals Survey on Tobacco (HPST)' that comprises six (6)

sections. The first section being participants' demographic variables,9 parameters. The second section has six questions regarding tobacco use and prevalence, and the third section contains four items regarding exposure to environmental tobacco smoke. The fourth section has 11 multiple-choice questions related to participants' tobacco use habits and cessation, whereas, the fifth section consists of six dichotomous questions regarding previous training received by participants. The last section on attitude towards tobacco use has 24 Likert questions.

3.12: Validity of research tool.

Ten experts (faculty from relevant departments) provided feedback on the tool's content validity, and their average proportional relevance was 0.98. Given that a cut-off score of S-CVI of >0.8 is regarded as reasonable, the scale content validity index of 0.985 and 0.852 was determined to be appropriate (Yusoff 2019, Polit et al 2007).

3.13: Reliability of research tool.

In terms of internal consistency and reliability, the questionnaire's Cronbach's alpha (α-0.894) was deemed adequate. A Cronbach's alpha of more than 0.7 is regarded as satisfactory (Taber 2018).

3.14: Ethical Consideration.

The Institutional Human Ethics Committee, Mizoram University, Tanhril, Aizawl, Mizoram after careful examination of the study protocol approved the study via letter No. MZU /HEC/2022/002 Dated 08.03.2022. The procedures followed were in accordance with the ethical standards of the institution as well as the Declaration of Helsinki revised in 2013. Informed consent was taken from each participant voluntarily before enrolment. The participants were also ensured anonymity and confidentiality of their data.

3.15: Pilot Study.

In June and July of 2022, a pilot study involving 65 healthcare professionals (16 % of the overall sample size) was carried out using the pen-and-paper method to evaluate the study's feasibility and the tool's psychometric testing for data collection.

3.16: Methods and procedure of data collection.

A hybrid form of data collection using a self-administered structured questionnaire ‘Health Professionals Survey on Tobacco (HPST)’. Data collection was done from January 2023- September 2023. 426 responses were received and processed for analysis comprising of Doctors 45, Dentists 17, Nurses 236, Pharmacists 40, MPHW 88.

3.17: Data Analysis.

Data will be analyzed using descriptive and inferential statistics.

4.0: ANALYSIS AND INTERPRETATION.

This chapter addresses data analysis and interpretation. Using the proper statistical procedures, the data was analyzed, and the results were also interpreted with consideration for the study's goals, which aligned with the objectives and hypothesis. Data were analyzed using the Statistical Package for the Social Sciences software (IBM SPSS Statistics for Windows, Version 25, IBM Corporation, Armonk, NY, USA). Descriptive data were reported as frequency and percentage. When analyzing qualitative (non-numerical) data, a chi-square test is used to compare observed and expected outcomes. Levene’s test was conducted to test the homogeneity of variances, and then the one-way analysis of variance (ANOVA) is used to ascertain whether the means of three or more independent (unrelated) groups differ statistically significantly. The Kruskal-Wallis test compares the mean rank on curriculum and training, exposure to tobacco smoke, tobacco use cessation, and attitude towards tobacco use among different professions under study. The degree to which different study parameters are associated with one another is measured by Spearman's rank correlation. A statistical test called multiple logistic regression is used to find out one or more binary variables for predicting attitudes and habits

toward tobacco usage. It is also employed to ascertain the numerical correlation among a group of variables. All the statistical analyses were carried out at a 5% significance level. Geographical map of the study area was prepared using QGIS v.3.16.2.

5.0: DISCUSSION, SUMMARY AND CONCLUSION.

This chapter deals with the summary of major findings, discussions, limitations, recommendations for future study, summary and conclusions.

5.1: Summary of findings.

The prevalence of tobacco use among healthcare professionals in the study is 47.2% of which smokers are 9.2%, smokeless tobacco users 34% and both smoking and smokeless 4%. There is a statistically significant difference ($p<0.05$) in the prevalence of tobacco use across different healthcare professionals. The mean of tobacco use prevalence is highest among the pharmacist and lowest among the nurses.

The frequency difference on how soon the participants smoked his/her first cigarette after waking up is statistically significant ($p<0.01$; highest during 0–5 mins and 31–60 mins (9; 16.1%), lowest during 6–30 mins (8; 14.3%).

The healthcare professionals smoking habits revealed that the amount of cigarette smoked per day is highest for 10 or less (40; 71.4%) and lowest for 21–30 cigarettes, and this frequency distribution is also statistically significantly different ($p<0.001$), a total of 47 (83.9%) participants want to stop smoking cigarette now while 9 (16.1%) of them did not want to stop smoking, and the frequency difference is statistically significant ($p<0.001$) a total of 34 (60.7%) have tried to stop smoking cigarettes during the past year, while 22 (39.3%) have never been trying to stop smoking during the past years, and the frequency difference is also statistically significant ($p<0.001$).

Regarding the attitude towards tobacco use the mean rank on attitude towards tobacco use is highest in dentists (278.0) and lowest in doctors (197.97). Prevalence of tobacco use have a statistically significant association with attitudes ($p<0.001$).

Those who do not use tobacco in any form has stronger association with attitude than those who use tobacco, those who are >30 years has stronger association with attitude compared to other age group, those who did not smoke a single cigarette during the past 30 days and those who used smokeless tobacco 1-2 days during the past 30 days has stronger association with attitude compared to other group. Socio-demographic characteristics and attitude towards tobacco use is having a statistically significant association ($p<0.001$). Age group of 30-39 has stronger association with attitude compared to other age groups. Gender is having a statistically significant association with attitude ($p<0.001$). Male contributes 82.4% (inertia value =0.824) of the chi-square statistics and has stronger association with attitude compared to female. Divorced participants have stronger association with attitude compared to other marital status group. Family type is having a statistically significant association with attitude ($p<0.001$). Nuclear family contributes 35.4% (inertia value =0.824) of the chi-square statistics and has stronger association with attitude compared to other family types. Food habit is also having a statistically significant association with attitude ($p<0.001$). Vegan contributes 76.9% (inertia value =0.769) of the chi-square has stronger association with attitude compared to non-vegetarians and vegetarians. The five different healthcare professions studied is also having a statistically significant association with attitude ($p<0.001$). Doctors contributes 55.3 % (inertia value =0.553) of the chi-square has stronger association with attitude compared to other professions.

There is significant association between the prevalence of tobacco use and socio-demographic characteristics. Forms of tobacco use is associated with socio-demographic characteristics such as age group ($p<0.001$), gender ($p<0.001$), marital status ($p<0.001$), profession ($p<0.001$) and work experience ($p<0.01$). Age when cigarette was tried for the first time is associated with demographic characteristics such as, age group ($p<0.01$) and food habit ($p<0.05$). Ever used smokeless tobacco such as paan masala, zarda, gutkha,khaini, paan or tubur (tobacco brew)is associated with demographic characteristics such as, religion ($p<0.05$) and marital status ($p<0.01$). Number of days smokeless tobacco is used in the past 30 days is associated with demographic characteristics such as, age group ($p<0.001$), religion ($p<0.05$), marital status ($p<0.05$), food habit ($p<0.05$) and work experience ($p<0.05$).Whether

smokeless tobacco is used in hospital/Clinic/Institute/Sub center's premises during the past year is associated with demographic characteristics such as, age group ($p<0.001$), gender ($p<0.001$) and marital status ($p<0.001$). Whether the participants smoked cigarette in hospital/Clinic/Institute/Sub center's premises during the past year is associated with demographic characteristics such as, food habit ($p<0.001$) and work experience ($p<0.01$).

Ever tried for experimented with cigarette smoking even one or two puffs is associated with demographic characteristics such as, age group ($p<0.01$) and food habit ($p<0.01$). Number of days of smoking cigarette in the past 30 days is associated with demographic characteristics such as, age group ($p<0.001$), religion ($p<0.01$), food habit ($p<0.01$) and work experience ($p<0.05$).

Variables such as gender, age, professions, tobacco use cessation and exposure to environmental tobacco smoke (independent variable) statistically significantly predicted tobacco use habits (dependent variable) $p<0.001$. Variables such as family, food habits and training on tobacco (independent variable) statistically significantly predicted attitude towards tobacco use (dependent variable) ($p<0.05$).

5.2: Limitations of the study.

The empirical findings presented here should be interpreted in the context of several potential limitations: -

- Due to the ongoing Covid 19 Pandemic, the setting for the study is confined to only one district that is Aizawl District. Collecting data from all the eleven districts of Mizoram may produce a better generalizable result.
- The researcher opted for proportionate stratified sampling technique but due to a great difference in the actual population of the healthcare professionals selected for the study, it resulted in variation in the sample size from each of the profession. Same sample size from each stratum/profession might give a better representation and valid comparison of prevalence of tobacco use among the categories of profession may be carried out.

5.3: Recommendations.

Base on the findings of the study, the following recommendations is made:

- Further research is needed to establish the reason behind the high rate of prevalence of tobacco use among healthcare professionals.
- Further research can be conducted to establish the factors associated with successful cessation of tobacco use among the healthcare professionals.
- Further research is needed to establish the effectiveness of tobacco cessation initiatives conducted by healthcare professionals.
- A further study that aim to investigate the causative factors of high rate of prevalence of smokeless tobacco use among nurses in Mizoram may be conducted.
- A study may be conducted to identify the factors contributing to successful cessation of tobacco use among previous tobacco users.

5.4: Conclusion.

Tobacco use prevalence among the healthcare professionals in Mizoram is high. The habits indicate need for assistance in cessation. There is a discrepancy in training received regarding tobacco by the healthcare professionals during the course of study. Non users of tobacco have better attitude than users of tobacco. Therefore, it is necessary to provide ongoing medical education on tobacco use cessation to all healthcare professionals with the goal of enhancing their knowledge, altering their attitudes, and fostering better practices. Healthcare professionals should be given access to tobacco cessation programs in order to lower the prevalence of tobacco use among them and establish themselves as positive role models for their communities. Healthcare professionals should be required to complete tobacco use cessation courses as part of their education. We must take into account that demographic characteristics such as gender, age, professions, tobacco use cessation and exposure to environmental tobacco smoke are predictors of tobacco use habits and also family, food habits and training on tobacco have strong association with attitude towards tobacco and make good use of these information while planning for tobacco cessation campaign.