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EFFECTS OF PASSIVE SMOKING ON NON-SMOKERS

– A Literature Review

BACHELOR'S THESIS | ABSTRACT

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EFFECTS OF PASSIVE SMOKING ON NON-SMOKERS

- A Literature Review

Millions of people are exposed to passive smoking each year. Since there is no safe level of exposure to secondhand smoke, a passive smoker also becomes vulnerable to the danger of tobacco use. The purpose of this thesis was to investigate the effects of passive smoking on non-smokers as well as the role of nurses in the control of secondhand smoke exposure.

A literature-based approach was utilized to gather relevant research articles from CINAHL Complete, Pubmed, and Google Scholar. A total of 18 peer-reviewed articles were independently reviewed and included according to the inclusion and exclusion standards.

The result of the study indicated that secondhand smoke exposure predisposes a passive smoker to the development of serious respiratory and cardiovascular diseases. A strong association between passive smoking and lung cancer has been identified. Other disease outcomes were: Chronic Obstructive Pulmonary Disease (COPD), Coronary Heart Disease (CHD), stroke, asthma, and tuberculosis.

Nurses can take an active role within the workplace in raising awareness and helping patients to quit smoking. As nurses we cannot prevent passive smoking but we can help an active smoker modify the behavior. We can also engage in anti-tobacco legislation within the society. Substantial health gains can be made by reducing exposure to secondhand smoke and the only effective way to prevent exposure is to eliminate smoking in all indoors. Smoke-free home and smoke-free workplace policies are the best way to protect people from exposure to secondhand smoke.

KEYWORDS:

Passive smoking, secondhand smoke, lung cancer, cardiovascular diseases, respiratory illness, coronary heart disease

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PASSIIVISEN TUPAKOINNIN VAIKUTUKSET TUPAKOIMATTOMIIN

- Kirjallisuuskatsaus

Miljoonat ihmiset altistuvat passiiviselle tupakoinnille vuosittain. Koska passiivisen tupakoinnin altistumiselle ei ole turvallista tasoa, passiivinen tupakoitsija joutuu myös alttiiksi tupakan käytön vaaroille. Tämän opinnäytetyön tarkoituksena oli tutkia passiivisen tupakoinnin vaikutuksia tupakoimattomille sekä hoitajien roolia passiivisen tupakoinnin altistumisen hillitsemisessä.

Kirjallisuuteen perustuvaa lähestymistapaa hyödynnettiin keräämällä yhteen aiheeseen liittyviä tutkimusartikkeleita CINAHL Complete:sta, Pubmedista ja Google Scholarista. Yhteensä 18 vertaisarvioitua artikkelia tarkasteltiin riippumattomasti ja sisällytettiin sisäänotto- ja poissulkusikriteerien mukaisesti.

Tutkimuksen tulokset osoittivat, että tupakansavulle altistuminen altistaa passiivisen tupakoitsijan vakaville hengitys- ja sydänsairauksille. Passiivisen tupakoinnin ja keuhkosityövän välillä on havaittu vahva yhteys. Muita mahdollisia sairauksia ovat: Keuhkohtaumatauti (COPD), sepelvaltimotauti (CHD), aivoverenkiertohäiriö, astma ja tuberkuloosi.

Sairaanhoitajat voivat toimia aktiivisesti työpaikalla lisäämällä tietoisuutta ja kannustamalla potilaita lopettamaan tupakointi. Sairaanhoitaja ei voi estää passiivista tupakointia mutta hän voi yrittää muuttaa aktiivisten tupakoitsijoiden käyttäytymistä. Voimme myös osallistua aktiivisesti yhteiskunnassa ottamalla kantaa tupakkalainsäädäntöön. Merkittäviä terveyshyötyjä voidaan saada vähentämällä altistumista passiiviselle tupakoinnille ja ainoa tehokas tapa estää altistuminen, on kieltää tupakointi kaikissa sisätiloissa. Linjaukset joilla tehdään kodeista ja työpaikoista savuttomia ovat paras tapa suojella ihmisiä altistumasta passiiviselle tupakoinnille.

ASIASANAT:

Passiivinen tupakointi, toistuva savu, keuhkosityöpä, sydän- ja verisuonitaudit, hengityselinten sairaudet, sepelvaltimotauti

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LIST OF ABBREVIATIONS

ALA	American Lung Association (American Lung Association 2018)
CAP	Community-Acquired Pneumonia (Almirall ym. 2014)
CDC	Center for Disease Control and Prevention (Center for Disease Control and Prevention 2016)
CNA	Canada Nurses' Association (Canada Nurses' Association 2018)
COPD	Chronic Obstructive Pulmonary Disease (Johannessen ym. 2012)
EPA	Environmental Protection Agency (Environmental Protection Agency 2018)
ETS	Environmental tobacco smoke (World Health Organization 2018)
FTC	Federal Trade Commission (Federal Trade Commission 2016)
IHD	Ishaemic Heart Disease (Fisher and Kraemer 2015)
SHS	Secondhand smoke (World Health Organization 2018)
TBP	Theory of Planned Behavior (Joseph ym. 2016)
USDHHS	U.S Department of Health and Human Services (U.S. Department of Health And Human Services 2014)
WHO	World Health Organization (World Health Organization 2018)

1.1 INTRODUCTION

Tobacco smoking remains the single greatest preventable cause of death in the world, killing more than seven million people each year. More than six million of those deaths are the result of direct tobacco use while around 890,000 are the result of non-smokers being exposed to second-hand smoke. (World Health Organization 2018.)

The harmful effects of second-hand smoke have been recorded since 1928 (Öberg 2011). Passive smoking, as defined by the World Health Organization (WHO), is the exposure to second-hand tobacco smoke (SHS) which is a mixture of exhaled mainstream smoke and side stream smoke released from a burning cigarette or other smoking device such as cigar and pipe. Second-hand tobacco smoke is also referred to as environmental tobacco smoke (ETS). (WHO 2018.)

There are approximately 600 ingredients in a cigarette and it creates more than 7,000 chemicals when burned. At least 69 of these chemicals are poisonous and are known to cause cancer. (American Lung Association 2018.) ETS has been classified as a known human lung carcinogen by the United States Environmental Protection Agency (EPA) since 1993. Accumulation of epidemiologic evidence has related passive smoking to cardiovascular and cerebrovascular diseases as well as respiratory diseases such as chronic obstructive pulmonary disease and asthma.(EPA 2018.) ETS has also been the most widely studied risk factor of lung cancer among non-smokers (Brownson ym. 1998). The present knowledge about the carcinogenic activity of secondhand smoke, the lack of any evidence to identify a minimum threshold for tobacco smoke inducing lung cancer and the increase in the risk of lung cancer with increased amount smoked suggest that an association between passive smoking and lung cancer is biologically possible (Taylor ym. 2007).

International Agency for Research on Cancer, WHO, the Californian Environmental Protection Agency, and the U.S. Department of Health and Human Services (USDHHS) recognise that there is no safe level of exposure to tobacco smoke and therefore recommend effective measures to provide protection from secondhand smoke exposure (Öberg ym. 2011).

Over the years, more and more scientists began to understand the chemical compositions of tobacco as well as the dangerous health effects tobacco smoking produces but it was only in 1964, when the U.S Surgeon General (1986) finally published a landmark report on the health consequences of tobacco smoking had the danger of smoking been realized. And in 1986, Surgeon General released another report entitled “The Health Consequences of Involuntary Smoking”, which focused entirely on ETS. The report covered toxicology of tobacco smoke, prevalence of exposure of nonsmokers to tobacco smoke as well as the epidemiologic evidence on involuntary smoking and the burden of disease risks for infants, children, and adult. (USDHHS 1986.)

Traditionally, tobacco control has not been a part of the nursing practice and research has shown that tobacco related content in nursing schools is minimal. But nurses are in optimal position to conduct and participate in clinical and community-based approaches and strategies to reduce exposure to ETS. The purpose of this thesis was to explore the effects of passive smoking on non-smokers as well as the role of nurses in the control of second-hand smoke exposure.

2 BACKGROUND

2.1 Brief History of Tobacco

Mayans and Aztec civilizations used tobacco for many rituals including pre-battle rituals, sexual or reproductive rituals and as gifts to the Gods. Priests and medicine men at those ancient times used tobacco as a medicine for mild ailments such as headache and colds and for more serious illnesses like delirium, blood poisoning and lupus. (Burns 2007, 4-8.) South American societies also used tobacco as analgesics and antiseptics. It is derived from the plant *nicotiana tabacum* and had been used as an effective insecticide for both crops and in treatment of lice and other parasites. Tobacco then arrived in Europe in the late 1500s, when Columbus was offered dried tobacco leaves as a gift from the American Indians he encountered and then he brought those tobacco leaves back home. Tobacco was then continued to be justified as medicinal by Europeans. (Musk and De Klerk 2003.) However, in the beginning of the 1600s some individuals realized the danger of smoking and the addicting effect of nicotine but these incidents did not affect the popularity of cigarettes and still continued to expand until the early 19th century. By 1800s, tobacco became a way of life. It became a source of income, a source of recreation and relaxation. (Burns 2007, 79.) Its economic effects and broad popularity forced acceptance among all cultures. It quickly spread throughout the civilized world and became a foundation for the growth of the American economy. The use of cigarettes further exploded during the World War I, where cigarettes were called the “soldier’s smoke”. Tobacco companies also began targeting women in advertisements during this period. (Brandt 2007, 51-55.) And on World War II, cigarette sales were at all-time high, when tobacco companies sent millions of cigarettes to the soldiers for free as part of their direct advertising strategy. In the 1950s, light cigarettes were introduced in response to concern about possible health effects of smoking. These cigarettes were marketed as a healthier option and even as a first step in smoking cessation. (Kropp and Halpern-Felsher 2004.) Then in 1965, e-cigarettes were introduced as a “safe and harmless” smokeless non-tobacco cigarettes. And as of today, e-cigarettes are now the most commonly used tobacco product among youth. (Center for Disease Control and Prevention 2016, 5-10.)

2.2 Tobacco Advertising

Tobacco has been marketed aggressively to the public through different channels and modalities in order to foster demand, create a more permissive environment of smoking and establish tobacco use as an acceptable social behavior (Lynch and Bonnie 1994). As reported by Federal Trade Commission (FTC 2016) in their Smokeless Tobacco Report (2016), tobacco products are one of the most heavily marketed consumer products in the U.S. In 2014, the largest cigarette manufacturers spent a total of almost 9 billion—or more than \$23 million dollars a day—for the promotion and advertisement of their products. (FTC 2016.)

Research conducted over the past several decades indicates that tobacco industry has engaged in developing genetically engineered tobacco to enhance nicotine delivery in order to manipulate cigarette nicotine levels thereby influencing people's smoking behaviors (Rabinoff ym. 2007). Nicotine activates the same reward pathways in the brain like other drugs of abuse such as cocaine or amphetamines thereby making the use of tobacco quickly addicting (Maritz and Mutemwa 2012.)

2.3 What's in a Cigarette?

There are approximately 600 ingredients in a cigarette and they create more than 7,000 chemicals when burned. At least 69 of these chemicals are known to be poisonous and cancerous. These cigarette ingredients include nicotine, tar, and carbon monoxide, as well as formaldehyde, ammonia, hydrogen cyanide, arsenic, and butane. (ALA 2018.) Sidestream smoke releases five times as much carbon monoxide and twice as much tar into the air as compared to what enters a smoker's lungs. Chemists concluded that cigarette smoke is 10,000 times more concentrated than the automobile pollution at rush hour on a freeway. (Golden ym. 2009, 131.)

There are actually higher concentrations of many carcinogens in second-hand smoke than in the smoke actively inhaled into lungs by smokers (USDHHS 2006). Visible smoke contributes only 5-8% to the total output of a cigarette and the remaining bulk that cannot be seen makes up the vapour or gas phase of cigarette smoke. It contains assortment of

toxic gases such as carbon monoxide, formaldehyde, acrolein, hydrogen cyanide, and nitrogen oxides. Smokers extract almost 90% of the particulates from the mainstream smoke of the 600 billion cigarettes consumed annually in the United States alone. Some of the chemicals found in a cigarette and their other uses are summarized in Table 1.

Table 1. Chemicals in a Cigarette (American Lung Association 2018)

CHEMICALS	OTHER USES
Acetone	Fingernail polish remover
Acetic Acid	An ingredient in hair dye
Ammonia	Found in urine and used in fertilizer
Arsenic	Rat poison and weed killer
Benzene	Found in rubber cement
Beryllium	A toxic metal used for x-ray tubes, nuclear weapons and rocket fuel additives
Butane	Cigarette lighter fluid
Cadmium	Used in paint and to make batteries
Carbon Monoxide	Found in car exhaust fumes
Ethylene oxide	Used to make pesticides
Formaldehyde	Used to preserve dead people
Hexamine	Found in barbecue lighter fluid
Hydrogen cyanide	Gas chamber poison
Lead	Used in batteries
Methanol	A main component in rocket fuel
Naphtalene	Used for mothballs
Nicotine	Used as insecticide
Stearic acid	Candle wax
Tar	Material for paving roads
Toluene	Used to manufacture paint

Nicotine, one of cigarette's primary ingredients, is concluded to be as addictive as cocaine and heroine by the U.S Surgeon General. Research has shown that nicotine increases the level of dopamine in the brain, resulting in feelings of pleasure and well-being. (Centers for Disease Control and Prevention ym. 2010; Maritz and Mutemwa 2012.) It is an alkaloid obtained from the leaves of the tobacco plant (Karaconji 2005). It is absorbed through the mouth, lungs, skin or gut, metabolized by the liver, and is excreted via urine, feces, bile, saliva and sweat. It is also one of the most toxic of all poisons with a rapid onset of action that can affect the different body systems, specifically the peripheral and central nervous system, causing tremors, convulsions and even coma in severe cases. (Mishra ym. 2015.) Inhaled nicotine can produce airway obstruction thereby making cigarette smoking the major cause of COPD (Karanconji 2005). The lethal dose of nicotine is estimated to range from 1mg/kg to 10mg/kg. Figure 1 shows the different sources of Nicotine and their nicotine contents in mg.

Figure 1. Sources of Nicotine. (Goldfrank's Toxicologic Emergencies, 2011)

Sources of Nicotine

Type/Formulation	Content of Nicotine (mg)	Nicotine Delivered by Intended Use
One cigarette	10-30	0.05-3
One cigarette butt	5-7	-
One cigar	15-40	0.2-1
1 ml of e-cigarette liquid	6-100	1
One piece nicotine gum	2 or 4	1-2
1 g of chew	6-8	2-4
One transdermal patch	8.3-114	5-22 over 16-24 hours
One spray/inhaler	0.5	0.2-0.4
One lozenge	2 or 4	2-4
Plants/leaves	9 mg/100 ml	-

2.4 Prevalence of Exposure to Secondhand Smoke

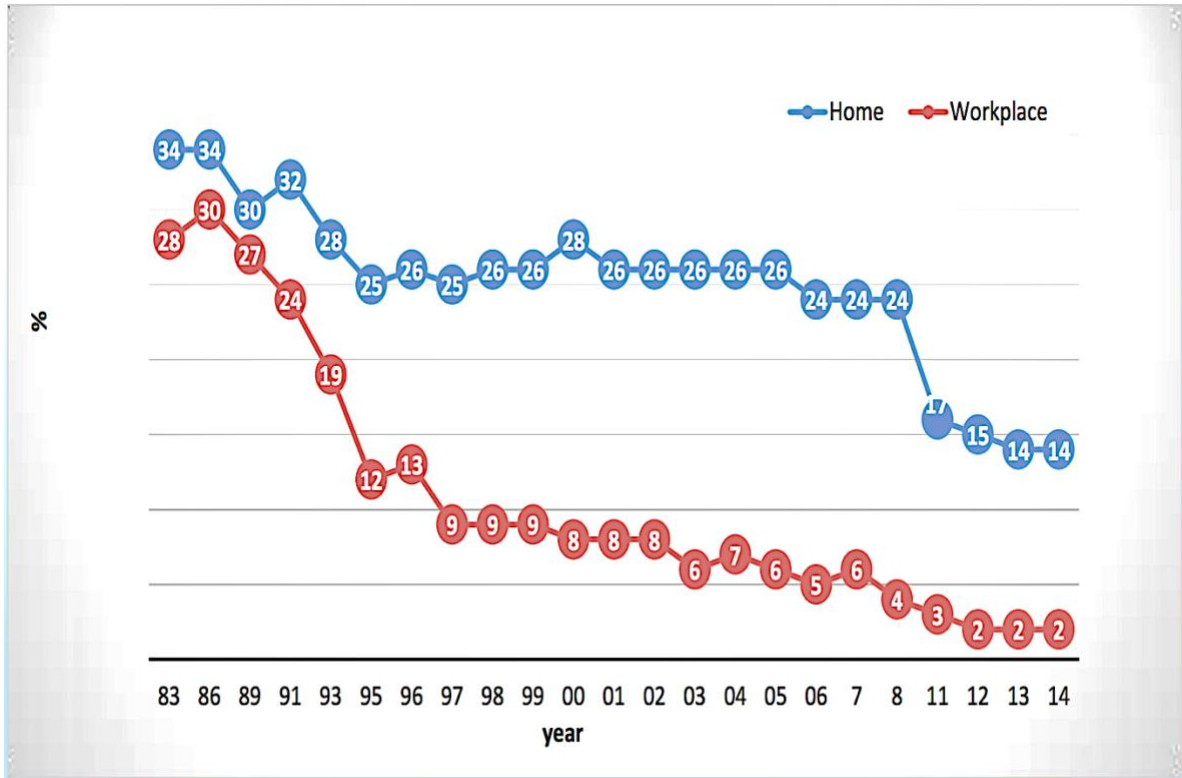
40% of children, 33% of male non-smokers, and 35% of female non-smokers were exposed to second-hand smoke worldwide. Exposure to second-hand smoke for children was often defined as having one or both parents who smoke or being exposed to tobacco smoke or to a person who smokes indoors. For adults, the definitions of exposure were often based on having a spouse who smokes or exposure to tobacco smoke at work and can be further characterized by the number of cigarettes smoked by the spouse, the duration and frequency of exposure. (Öberg ym. 2011.) The estimates are shown in Figure 2.

Figure 2. Proportion of children and adult non-smokers exposed regularly to SHS smoke in 2004 by WHO region. (Öberg ym. 2011)

	Children†‡ (%)	Men (%)	Women (%)
Africa (D)	13	7	11
Africa (E)	12	4	9
The Americas (A)	24	16	15
The Americas (B)	29	14	22
The Americas (D)	22	15	19
Eastern Mediterranean region (B)	38	24	25
Eastern Mediterranean region (D)	33	21	35
Europe (A)	51	35	32
Europe (B)	56	52	54
Europe (C)	61	66	66
Southeast Asia region (B)	53	32	56
Southeast Asia region (D)	36	23	19
Western Pacific region (A)	51	50	54
Western Pacific region (B)	67	53	51
Worldwide	40	33	35

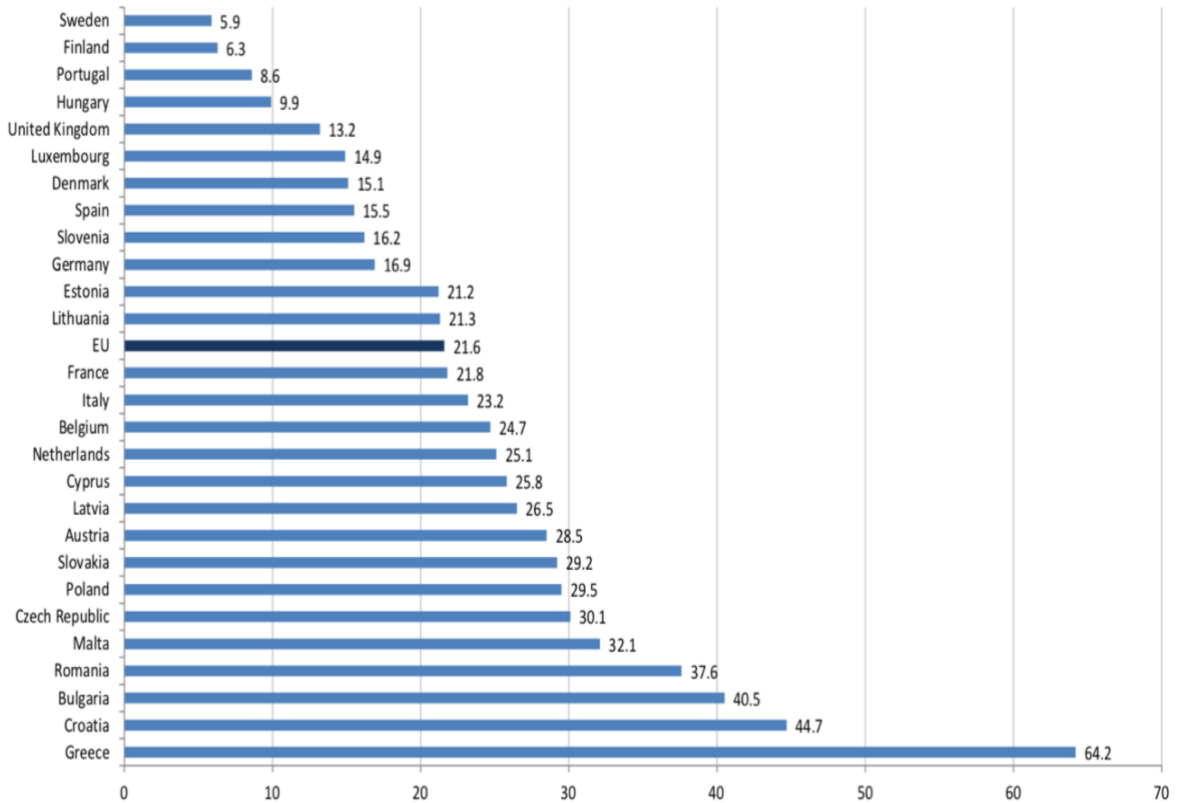
In Finland, the number of employees exposed to SHS has considerably decreased mainly due to the implementation of the Tobacco Control Act of 1976 in 1995 that prohibits smoking at work. Figure 3 shows the prevalence of daily exposure to ETS at work and at home among non-smokers between 1983-2014.

Figure 3. The prevalence of daily exposure in Finland to SHS at work and at home among non-smokers in 1983-2014. (Terveyden ja Hyvinvoinnin Laitos 2015)



The European Health Interview Survey (2014) report also claimed that 1 in every 4 persons aged 15 or over in the European Union is a smoker and 1 in 5 is exposed to SHS. Among EU Member States, Sweden, Finland, Portugal and Hungary scored the lowest shares of SHS exposure indoors, affecting only less than 10% of the population and Greece had the highest prevalence of SHS exposure indoors, exposing 64.2% of its population on a daily basis. Figure 4 shows the different EU countries and their daily exposure to SHS indoors for the year 2014 as reported by Eurostat. The data on smoking habits of the population aged 15 or over will be attached differently in the Appendix (B).

Figure 4. Daily Exposure to SHS indoors in the EU Member States, 2014. (% of population aged 15 or over) (Eurostat)



While homes and workplaces remains the predominant locations for exposure to environmental tobacco smoke and tends to be higher for lower income individuals, exposure to secondhand smoke still continues in some restaurants, bars, and casinos (USDHHS 2006.) A study conducted by American Journal of Public Health (Repace 2009) in Pennsylvania casinos concluded that nonsmoking workers or costumers exposed to casino SHS in an eight hour shift would experience "unhealthy air" in accordance to the US Air Quality Index. SHS-induced heart disease and lung cancer will cause an estimated six Pennsylvania casino workers' deaths annually, five-fold the death rate from Pennsylvania mining disasters. (Repace 2009.)

A separate study by Minh et.al (2012) conducted in Vietnam correlates the status of exposure to SHS at home among non-smokers at home by gender, age, occupation,

ethnicity, residence, and smoking restrictions at home (Minh ym. 2012). The findings are summarized in Table 2.

Table 2. Patterns of SHS at home among non-smoking populations by socio-demographic characteristics. (Minh ym. 2012)

CHARACTERISTICS	FINDINGS / PREVALENCE
Gender	Females were more likely to be exposed to SHS at home than males
Age	Increasing age decreased the prevalence of exposure to SHS at home
Occupation	People working as service/sales, farmer, production, drivers are more likely to be exposed to SHS at home than managers
Ethnicity	People belonging to ethnic minority groups were more likely to be exposed to SHS at home
Residence	People living in rural areas were more likely to be exposed to SHS at home than people living in urban areas
Smoking restrictions in the home	Exposure to SHS at home was significantly prevalent in households where smoking is allowed.

3 PURPOSE AND RESEARCH QUESTIONS

The purpose of this thesis was to explore the effects of passive smoking on non-smokers and the nurse's role in the control of second-hand smoke exposure and the aim was to provide an evidence-based literature review to be published on Theseus and a powerpoint presentation to be published in Terveysnetti.

The research questions for this project were:

1. What are the effects of passive smoking on non-smokers?
2. What is the role of nurses in the control of second-hand smoke exposure?

4 DATA AND METHODS

4.1 Review Method

A literature review is a search and evaluation of the available literature in a given subject or of a chosen topic area. It is “objective, thorough summary and critical analysis of the relevant available research and non-research literature on the topic being studied” (Hart 1998). A literature review provides readers a background study with the current knowledge and clarify the importance of the new study (Polit and Beck 2010, 170).

Literature review is a systematic investigation of knowledge that is available on a certain topic. It is written using peer-reviewed articles and sources which are designed to be as unbiased and objective as possible. It is essential for literature review to be unbiased and the information given must be accurate and uninfluenced by somebody’s opinion or personal interests. (Aveyard 2007.)

According to Oliver (2012), the key aspect to be taken into consideration during research process based on literature review is the structure. Information obtained should be systematic and is correlated to the subject matter. The literature should be presented in an orderly manner, considering the importance of making the literature easy to follow by readers. Arguments presented as expected, should be based on academic research facts and not thoughts or opinions. (Oliver 2012.)

Literature review is also essential because it ensures that much of the previously conducted studies can be summarized together. Owing to the fact that a lot of previous studies have been conducted, it is difficult for readers to assimilate all the information without bringing them together through literature review. This method of study therefore ensures that scattered information is brought together through summary. (Aveyard 2007.)

Literature review must be well-organized and the overall evidence are evaluated critically to reveal the current state of knowledge on the given topic. Reviews with inconsistent results should not be ignored but must be analysed objectively to ensure validity and integrity of the given research statistics. (Polit and Beck 2010, 185).

4.2 Data Collection

For the collection of data, variety of search engines and keywords related to the research questions were used. Turku University of Applied Sciences provides databases for use such as CINAHL (Cumulative Index to Nursing and Health Alliance Literature) Complete and PubMed. A public search engine like Google Scholar was also utilized. Table 3 provides a clearer picture of the search strategy used to select articles in relation to the research questions.

Table 3. Inclusion and Exclusion Criteria

INCLUSION	EXCLUSION
Articles and journals published between year 2007 – 2018	Articles and journals published prior to 2007
Articles written in English only	Articles written in another language
Open access articles and journals both in Abstract and Full text	Abstracts and full text are not available
Scientific-based articles and journals	Articles that required payment and non-scientific
Effects of passive smoking on non-smoking adults	Effects of passive smoking on children and pregnant women

The authors used these three main key databases to obtain numerous articles using the key phrases such as “passive smoking”, “lung cancer”, “coronary heart diseases”, “respiratory illness”, and “theory of planned behavior”. The key word “passive smoking” alone with the refined search generated 278 results in CINAHL Complete, 1565 search results from PubMed with a five-year limitation and 7 million from Google due to lack of inclusion and exclusion criterias in the database search. Due to the exhausting results, the relevance of each articles were undetermined. However, by further narrowing down and screening using the inclusion and exclusion criteria, the search generated more relevant amount of articles related to passive smoking on adults both from CINAHL Complete and Pubmed and most of these articles were considered. Multiple articles were chosen from both database searches and a total of 18 articles were finally included in the thesis. Abstracts of the articles

retrieved during search procedures were independently reviewed and articles were examined on a case-to-case basis.

A public search engine was also utilized, specifically Google, Inc. and Google Scholar, mostly for searching trusted sites of different government organizations such as WHO and U.S Department of Health and Human Services (USDHHS) that have studied the effects of passive smoking, different scientifically-based reviews and trusted articles that were made available to the public but were not found in CINAHL Complete or PubMed. For the role of nurses in control of control of secondhand smoke, Google was mainly used for the explanation of Newman’s Theory of Expanding Consciousness (Endo 2017) and Theory of Planned Behavior (Kirk ym. 2007) as well as O’Connell’s (2009) research as the article is only available in abstract form in PubMed. Google was also the main search engine in finding the role of nursing in the control of SHS exposure. Overview of the literature search is shown below (Table 4.)

Table 4. Overview of literature search.

DATABASE	KEYWORDS	NUMBER OF HITS	PICKS	ARTICLES
CINAHL Complete	Passive smoking * lung cancer	28	4	Mu ym. 2013 Stayner ym. 2007 Repace 2009 Öberg ym. 2011
CINAHL Complete	Passive smoking * cardiovascular diseases	10	1	Heo and Lee 2015
CINAHL Complete	Passive smoking * respiratory illness	20	1	Brenner ym. 2010
CINAHL Complete	Passive smoking * Coronary Heart Disease	5	1	Awawdi ym. 2016

CINAHL Complete	Passive smoking * tuberculosis	23	2	Leung ym. 2010 Patra ym. 2015
PubMed	Passive smoking * lung cancer	1640	5	Cao ym. 2015 Coogan ym. 2015 Hori ym. 2016 Li ym. 2015 Taylor ym. 2007
PubMed	Passive smoking * coronary heart disease	344	1	Fisher and Kraemer 2015
PubMed	Passive smoking * respiratory illness	291	1	Johannesseen ym. 2012
PubMed	Passive smoking * community acquired pneumonia	7	1	Almirall ym. 2014
PubMed	Theory of planned behavior * nursing * smoking cessation	13	1	Joseph ym. 2016

4.3 Data Analysis

Data analysis determines the trends and relationships among the variables and summarizes the process of data collection. It helps in the interpretation of data and takes a decision or answers the research question. Data analysis starts with the collection of data followed by sorting and processing it. The steps of data analysis are finding the main themes and then the differences and similarities between the data (Polit and Beck 2012, 119.) Analysis of data should be adequate to reveal its significance and the reliability of the data should be checked carefully.

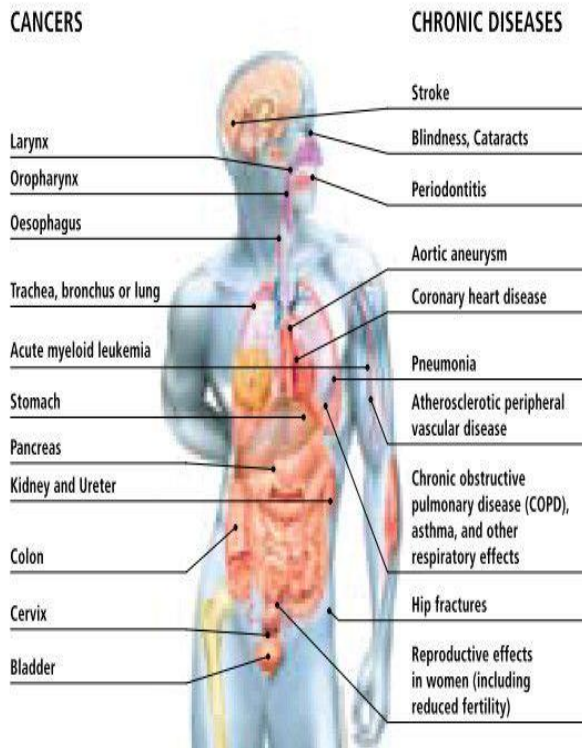
Tabulation is a part of technical procedure where the summarized raw data are put in a form of table. Tables are essential for reducing explanatory and descriptive statement to a minimum and it easily facilitates the process of comparison. (Kothari 2004, 18-27.) For the presentation of the data analysis, a research table was made and has been attached in the Appendix (A).

5 RESULTS

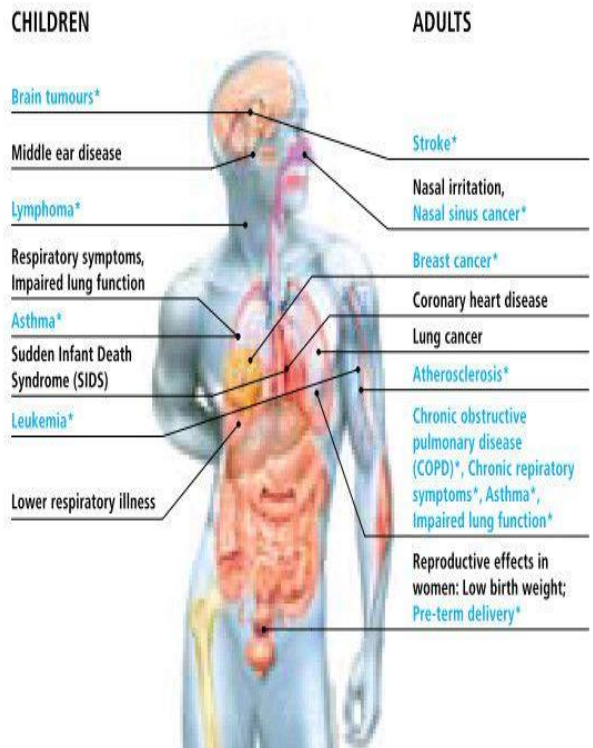
In this chapter the authors tackle the effects of passive smoking and how nurses can take more effective roles in the control and prevention of secondhand smoke.

5.1 Effects of Passive Smoking on Non-smokers

DISEASES CAUSED BY SMOKING



DISEASES CAUSED BY SECOND-HAND SMOKE



* Evidence of causation: suggestive
Evidence of causation: sufficient

Figure 5. Diseases Caused by Active and Passive Smoking. (US Department of Health and Human Services 2004, 2006)

Figure 5 is an illustration about the different chronic diseases and illnesses acquired by an active and a passive smoker according to the U.S Surgeon General. Table 5 is a summary taken from the Surgeon General’s 2006 report entitled “The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General.” It summarizes the effects between passive smoking and the different serious diseases a non-smoker can acquire from SHS exposure. To support the data, relevant articles were searched and counterchecked on the basis of accuracy and recent findings.

Table 5. Effects of Passive Smoking. (U.S Department of Health and Human Services 2006)

DISEASES	CONCLUSION
<p>1. Cancer</p> <p>a. Lung Cancer</p> <p>b. Breast Cancer</p> <p>c. Cervical Cancer</p>	<ul style="list-style-type: none"> - Sufficient evidence suggests that SHS exposure can cause lung cancer among non-smokers. - A 20 – 30 percent increase in the risk of lung cancer from SHS exposure associated with living with a smoker. - Insufficient but suggestive evidence links SHS and breast cancer. - Inadequate evidence to infer the presence or absence of a causal relationship between SHS exposure and the risk of cervical cancer among lifetime non-smokers.
<p>2. Cardiovascular Diseases</p> <p>a. Coronary Heart Disease</p>	<ul style="list-style-type: none"> - Sufficient evidence suggests a causal relationship between SHS exposure and increased risks of coronary heart diseases morbidity and mortality among men and women.

<p>b. Stroke</p> <p>c. Vascular Disease</p>	<ul style="list-style-type: none"> - A 25 to 30 percent increase in the risk of coronary heart disease from exposure to SHS. - Insufficient but suggestive evidence infers a causal relationship between SHS and stroke. - Insufficient but suggestive evidence infers a causal relationship between SHS exposure and atherosclerosis, particularly carotid arterial wall thickening. 	
<p>3. Respiratory Diseases</p> <p>a. Asthma</p> <p>a. Chronic Obstructive Pulmonary Disease (COPD)</p>		<ul style="list-style-type: none"> - Insufficient but suggestive evidence infers a causal relationship between SHS exposure and adult-onset asthma. - Insufficient but suggestive evidence infers a causal relationship between SHS exposure and the worsening of asthma control. - Insufficient but suggestive evidence infers a causal relationship between SHS and the risk for Chronic obstructive pulmonary disease. - Inadequate evidence links the presence or absence of a casual relationship between SHS exposure and morbidity in persons with COPD.

A data analysis (Öberg *et al.* 2011) from 192 countries estimating the worldwide SHS exposure and its burden of disease in both child and adult non-smokers is shown in Figure 6.

Figure 6. Number of deaths from exposure to second-hand smoke in 2004 by WHO subregion. (Öberg *et al.* 2011)

	Lower respiratory infections in children <5 years	Otitis media in children <3 years	Asthma in children <15 years	Asthma in adults	Lung cancer in adults	Ischaemic heart disease in adults	Total
Africa (D)	23 219	2	63	1634	177	3063	28 200
Africa (E)	20 025	4	62	1796	276	2568	24 700
The Americas (A)	65	1	11	288	596	12 604	13 600
The Americas (B)	4169	12	60	932	681	11 427	17 300
The Americas (D)	1555	1	9	140	93	982	2800
Eastern Mediterranean regions (B)	1771	0	13	727	142	6223	8900
Eastern Mediterranean regions (D)	30 518	11	96	2243	318	22 011	55 200
Europe (A)	60	1	10	1112	1993	32 283	35 500
Europe (B)	5367	1	106	1306	751	29 966	37 500
Europe (C)	818	2	3	3277	1096	94 109	99 300
Southeast Asia region (B)	4465	0	135	3681	631	18 433	27 300
Southeast Asia region (D)	55 956	23	333	9827	1864	67 095	135 000
Western Pacific region (A)	39	0	5	697	938	8769	10 400
Western Pacific region (B)	17 150	13	243	8113	11 850	69 659	107 000
Worldwide	165 000	71	1150	35 800	21 400	379 000	603 000

A more recent systematic literature review by Cao et al. (2015) that investigated the association between passive smoking and certain diseases covering 130 cohort studies, 159 control studies and 161 cross-sectional studies involving 25 diseases or health problems were reviewed and is summarized below (Table 6.)

Table 6. The Health Effects of Passive Smoking. (Cao ym. 2015)

MAIN HEALTH CONSEQUENCES OF PASSIVE SMOKING	
A. Passive smoking and cancer risks	<ul style="list-style-type: none"> • Passive smoking were found to be associated with increased lung cancer • A positive relationship between positive smoking and cervical cancer is suggested • Pancreatic cancer, breast cancer and bladder cancer were not found to be associated with passive smoking
B. Passive smoking and allergic diseases	<ul style="list-style-type: none"> • A consistent evidence of a modest positive association between passive smoking and childhood asthma
C. Passive smoking and other diseases	<ul style="list-style-type: none"> • Effects of passive smoking on increased risk of coronary heart disease, diabetes and tuberculosis were not conclusive due to low quality of the corresponding metalysis.

5.1.1 Cancer

Passive smoking can lead to lung cancer in non-smoking adults. Non-smokers who are exposed to passive smokers at home and at work increase the risk of developing lung cancer by 20-30%. Aggregated exposure to ambient tobacco smoke is estimated to produce about 5000 lung cancer deaths per year in U.S. alone and based on a study conducted by the U.S Surgeon General between 1964-2014, 2.5 million died from exposure to secondhand smoke, approximately 7,330 deaths from lung cancer and 33,950 deaths from heart disease each year. (USDHHS 2014.)

Furthermore, secondhand smoke increases the risk of casino workers and other workers exposed to ETS in developing lung cancer, as well as family members being exposed to SHS at home (Stayner *et al.* 2007; Repace 2009; Brenner *et al.* 2010). Two different studies conducted in China (Mu *et al.* 2013; Li *et al.* 2015), one in Japan (Hori *et al.* 2016) and one based per continent by Taylor *et al.* (2007) all revealed a significant increase in the risk of acquiring lung cancer among female non-smokers exposed to heavy passive smoking at work and non-smoking women to smoking spouses, (Taylor *et al.* 2007; Mu *et al.* 2013; Li *et al.* 2015; Hori *et al.* 2016) also correlating a positive association with breast cancer risk mainly among menopausal women exposed to SHS at home (Li *et al.* 2015).

5.1.2 Cardiovascular and Respiratory Diseases

A systematic literature review conducted by Fisher and Kraemer (2015) using the meta-analysis method that included 24 previous articles and studies regarding passive smoking and its connection to COPD, stroke and Ischaemic heart diseases (IHD) further reiterated the increase risk of a non-smoker to suffer from these diseases, most especially from COPD, also further suggesting a strong and consistent association between SHS and stroke. (Fisher and Kraemer 2015.) For all three outcomes, the effect sizes were larger for women than for men. This result is assumed to be connected to the anti-estrogenic effect of cigarette smoking that increases the risk of IHD in women, linking hormonal factors in the increased vulnerability to SHS exposure. Heo and Lee (2014) in a separate study attributed secondhand smoke as a considerable disease burden among non-smoking Korean women. Researchers in Bergen, Norway also revealed that passive smoking during childhood increased the overall risk of developing COPD than exposure to environmental smoke in adulthood (Johannessen *et al.* 2012). A study further correlates an increase risk of suffering a myocardial infarction by 4-fold in partners of spouses that smoked more than 20 cigarettes a day (Awawdi 2015).

An increase in the relative risk of active tuberculosis, another infectious disease of the lungs, was also noted due to secondhand smoke exposure. Patra *et al.* (2015) and Leung *et al.* (2010) concluded that sidestream smoke can weaken the lungs' first lining of defense or mechanical barriers thereby increasing the individual's susceptibility in acquiring TB infection that can lead to tuberculosis disease progression. (Leung *et al.* 2010; Patra *et al.* 2015).

2015). Acute tobacco smoke exposure also plays a role in increasing allergic sensitization by having its adverse effects on the airway epithelium, worsening allergic responses to inhaled allergens. This mechanism increases the risk among non-smokers but still presents some limitation between passive smoking exposure with adult-onset Asthma. (Coogan ym. 2015).

In the case of Community Acquired Pneumonia (CAP), SHS exposure only shows a significant effect in participants 65 years old or above who maybe exposed for a prolonged period of time, but the influence of passive smoking exposure on the appearance of CAP in adults of all ages on the basis of this population-based study still remains uncertain (Almirall ym. 2014.)

5.2 Role of Nurses in the Control of Secondhand Smoke Exposure

In the sub-chapters, the roles of nurses in the control of SHS exposure will be discussed and divided into two parts: the theoretical-based approach and the clinical/community-based approach. The theoretical-based approach focuses on two particular behavioral theories (Newman's Theory of Expanding Consciousness and the Theory of Planned Behavior) guiding nursing research about smoking cessation and other nursing theories will be discussed briefly. The clinical/community-based Approach will focus more on the different nursing roles and interventions applicable on both clinical and community setting.

5.2.1 Theoretical-based approach

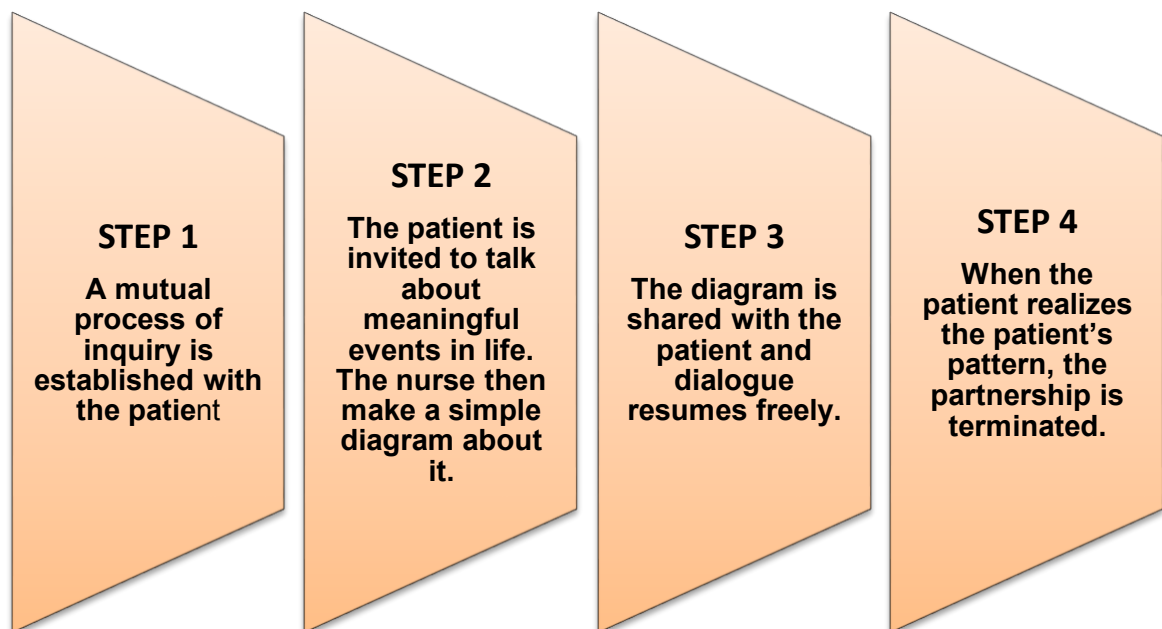
According to Evans (2011), the relationship between knowledge and behavior change is complex and can lead to mental conflict. And in order to achieve consonance, either the belief or the behavior must be changed. (Evans 2011.) Well-established theories can enable nurses to identify and describe health behaviors and develop evidence of what is most likely to change a target behavior and behavioral health theory provides a good framework for designing, implementing and evaluating the effects of health promotion programs (Barley

and Lawson 2016; Joseph 2016). However, a single theory offers no guarantee of success due factors influencing smoking cessation such as societal norms, community, family, individual or physiological. Because no single theory can manage all these levels, theory-based interventions often use more than one theory. (O'Connell 2009).

A. Newman's Theory of Expanding Consciousness

Margaret Newman's nursing model of health as expanding consciousness and crisis theory could be used as a theoretical foundation. Newman's expanding on a concept of health and illness proposed a view of health that includes a dialectical fusion of disease and non-disease, bringing about the synthesis of health. The tension in illness can allow patterns of expanding consciousness to emerge. Serving as an integrating factor, illness may facilitate desired change for the person or growth. Such change is reflected in the person-environment interactional pattern. It can be derived from this theory that once smokers are aware of the ill effects of smoking their smoking might be lessened. (Endo 2017.)

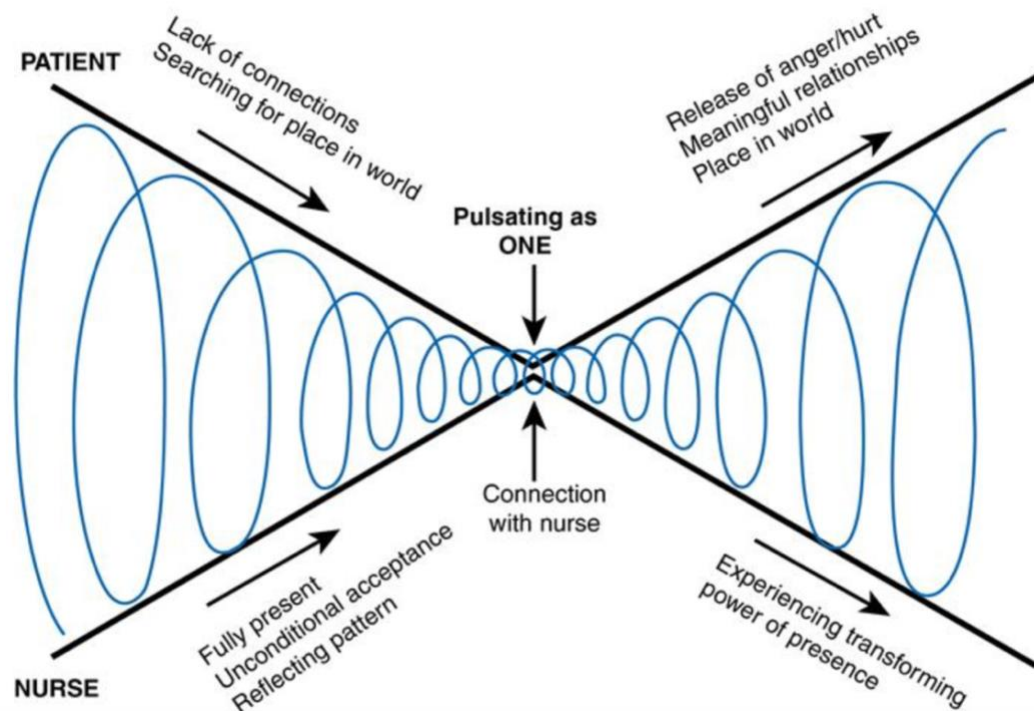
The HEC Praxis: The Process of Pattern Recognition or PRAXIS is a type of nursing intervention that focuses on the patient as a whole and finds meaning in the experience. The aim is to genuinely interact with the patient, with both growing in the sense of higher levels of consciousness. The step-by-step process of Praxis is:



A nurse enters this process with the patient is in a state of chaos. Newman's nursing theory is seen as a partnership between the nurse and the patient. It states that consciousness is a manifestation of an evolving pattern or a person-environment interaction. (Endo 2017.)

Figure 7 shows how a nurse and a patient coming together and moving apart in process recognition, insight and transformation.

Figure 7. Process of caring partnership based on Newman's Theory of Expanding Consciousness (Newman 2008)



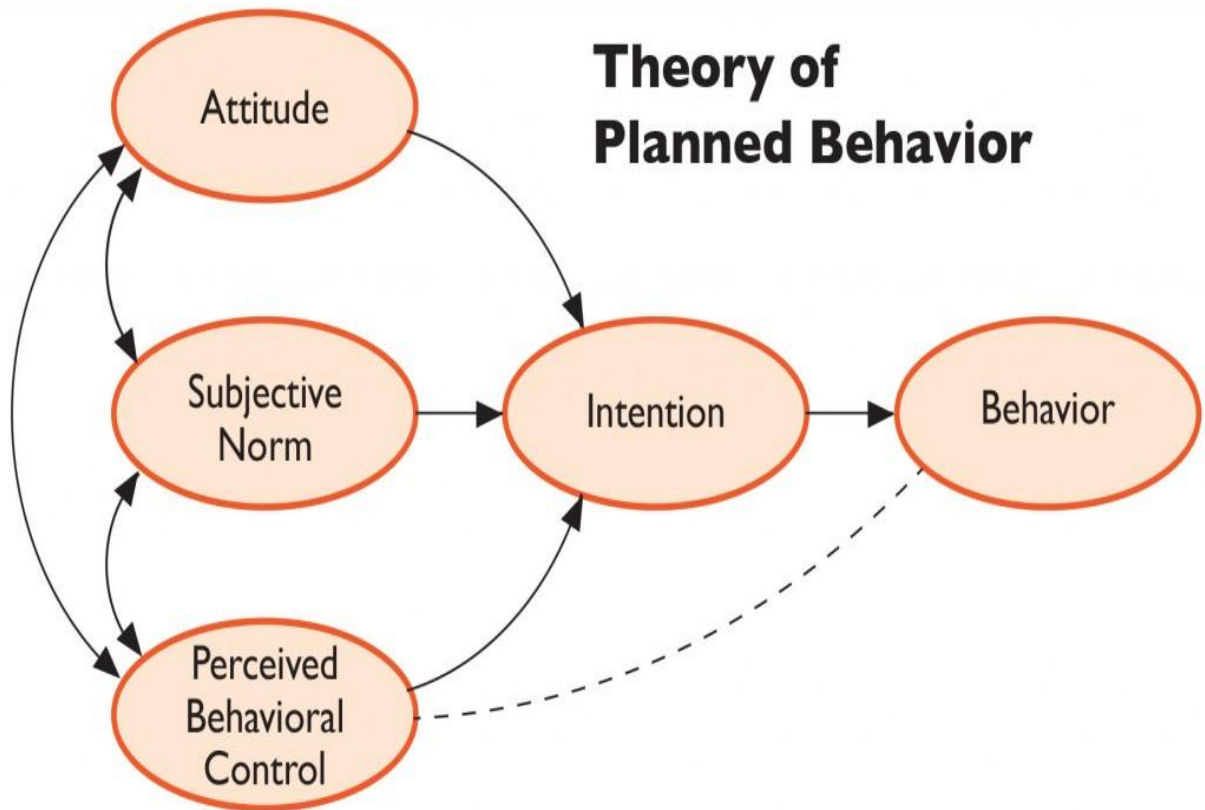
B. Theory of Planned Behavior

On the other hand, Theory of Planned Behavior (TPB) is directed towards health providers such as nurses and is one of the most widely used in research (Kirk ym. 2007). The TBP has been used in many studies to understand, predict and design interventions to change health behaviours and health professionals' behavioral intentions and behaviours. These include studies measuring and predicting nurses' behaviours in relation to 38 providing

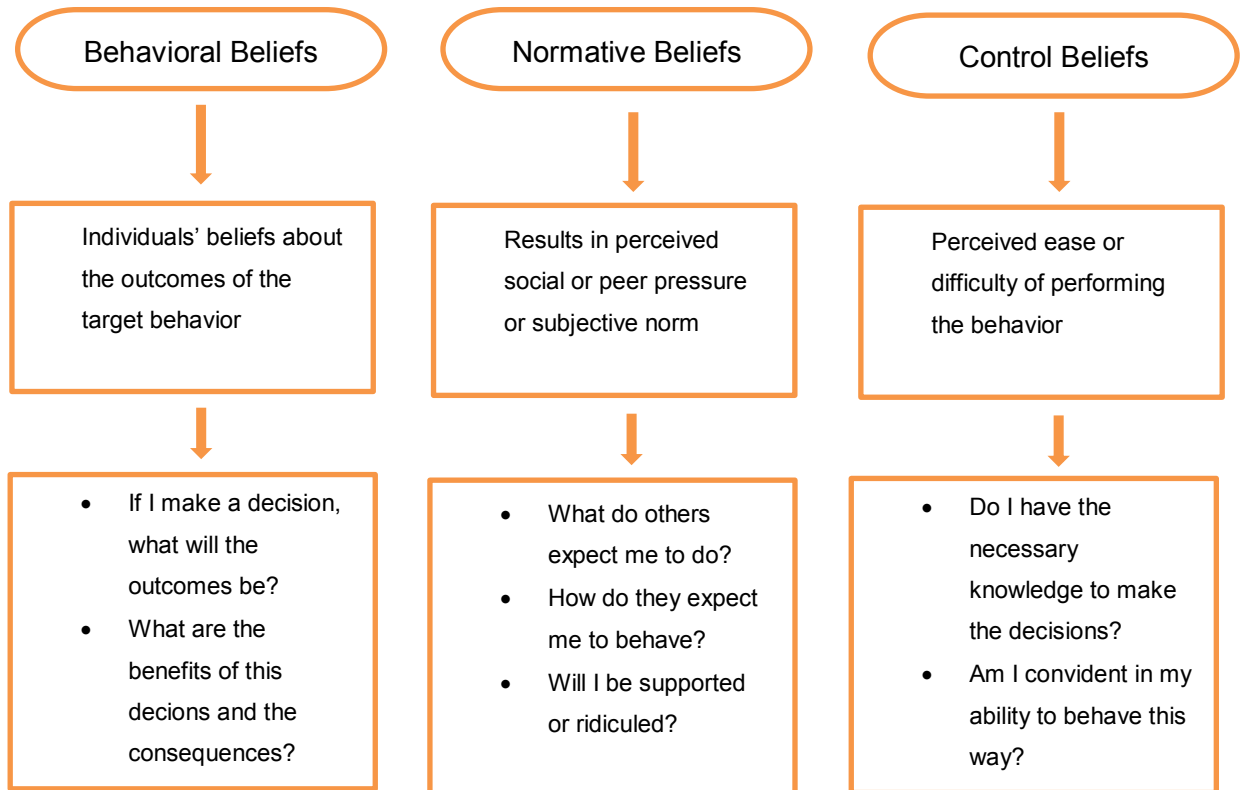
specific interventions such as smoking cessations and implementing best practice guidelines. (Godin and Kok 1996.)

According to TBP, considering the consequences of demonstrating the behavior or not, behaviors are adopted for a reason (Kirk ym. 2007). People will likely perform a behavior and a greater behavioral intention if favorable attitudes and subjective norms towards the behavior is present and there is a high perceived control over performing the behavior. Thefore by using the TBP to encourage a smoker to abstain from tobacco use, the development of many chronic diseases is greatly reduced. (Joseph ym 2016). The TBP model is illustrated in Figure 8.

Figure 8. The Theory of Planned Behavior. (Azjen 1991)



The TBP asserts that the best predictor of behavior is Behavioral intention (Werner 2012; Kirk 2007) and it is influenced by three factors as shown in the flowchart below.



C. Other Nursing Theories

According to O'Connell (2009), nursing theories in smoking cessation research were rarely used. Smoking cessation research is a multidisciplinary phenomem that requires nurse researchers to be familiar with a wide body of disciplinary approaches and to look outside of nursing literature for ideas about smoking. Moreover, it is only in the last few years that research on smoking cessation has become more common in nursing. However, it is possible that nursing theories may be able to explain some phenomena in smoking. (O'Connell 2009.)

Table 7 shows the different nursing theories guiding research about smoking cessation and Table 8 is about the different concepts and implicit theories used in smoking cessation studies.

Table 7. Nursing Theories Guiding Research About Smoking Cessation. (O'Connell 2009)

NAME OF THEORETICAL FRAMEWORKS	DESCRIPTION OF THEORY/MODEL
1. Orem Self-Care Deficit Theory	<p>People maintain life and well-being by caring for themselves. It comprises of three theories:</p> <ul style="list-style-type: none"> • Self-care deficits • Self-care • Nursing systems
2. Roy Adaptation Model	<p>A person is an adaptive system with input, control process (regulator and cognator), effectors (physiologic, self concept, role function, and interdependence), and output (adaptive and ineffective responses)</p>
3. Interaction Model of Client	<p>Health outcomes are influenced by elements of client's singularity (e.g previous experience, intrinsic motivation, affective responses) and the client-provider relationship (e.g. affective support, decisional support, professional competence)</p>
4. Meleis Transition Theory	<p>A transition is a change in health status, role relationships, expectations, or abilities. Transitions may involve perceptions of disconnectedness, temporary loss of familiar reference points, new needs, or unmet needs and vulnerability to risks.</p>

Table 8. Frequently Used Concepts and Possible Implicit Theories in Smoking Cessation Studies Not Using Formal Theories. (O’Connell 2009)

MAJOR CONCEPTS	POSSIBLE IMPLICIT THEORIES
<p>1. Nicotine Dependence</p> <p><i>a. Nicotine dependence</i></p> <p><i>b. Nicotine replacement therapy or pharmacotherapy</i></p>	<ul style="list-style-type: none"> • There are racial differences in dependence • Smoking to cope with the stress lead to increased dependence • Secondhand smoke leads to nicotine dependence • Dependence influences quitting • Because nicotine is addictive, success at quitting is increases by using pharmacotherapy to replace nicotine or to mimic its effects.
<p>2. Social Support</p> <p><i>a. Support from Nurses and Other Healthcare Provider Support</i></p> <p><i>b. Partner / Family / Peer Support</i></p>	<ul style="list-style-type: none"> • Support for cessation from nurses and health care providers including interventions by improve quit rates • Partner, family and peer support helps improves quit rates
<p>3. High risk situations</p> <p><i>a. Strategies for coping with cravings</i></p> <p><i>b. Environmental cues, including partner or family smoking</i></p>	<ul style="list-style-type: none"> • Use of coping strategies during high risk situations improve success at quitting • Smoking cues hightens cravings and lead to lapses during cessation
<p>4. Affect/Mood</p> <p><i>a. Anxiety and psychiatric symptoms</i></p>	<ul style="list-style-type: none"> • Anxiety and psychiatric symptoms increase relapse

<p><i>b. Stress</i></p>	<ul style="list-style-type: none"> • Stress increases smoking and relapse • Interventions to reduce stress will prevent relapse
<p>5. Influence of Diagnosis</p>	
<p><i>a. Diabetes</i></p>	<ul style="list-style-type: none"> • Severity of diabetes affects willingness to quit
<p><i>b. Heart</i></p>	<ul style="list-style-type: none"> • Gender and age affects likelihood of continued smoking
<p><i>c. Lung Disease</i></p>	<ul style="list-style-type: none"> • Feedback on decline in lung function increases likelihood of quitting and lung cancer diagnosis affects willingness to quit
<p><i>d. Pregnancy</i></p>	<ul style="list-style-type: none"> • Pregnancy affects willingness to quit • Age and socio-economic status affect pregnant smokers' willingness to quit
<p><i>e. Mental Illness</i></p>	<ul style="list-style-type: none"> • Serious mental illness makes cessation more difficult

5.2.2 Clinical and community-based approach

Historically nurses worked as advocates to ban smoking. Understanding the effects of passive smoking can empower nurses to take an active role in patient's health. Nurses can take a more effective role within the workplace in raising awareness and encouraging patients to stop smoking. They can also take an active role within society by engaging in anti-tobacco legislation. (Smith ym. 2005.)

A survey conducted by Evans (2011) revealed that the respondents know the risk of respiratory illnesses related to SHS exposure but are less aware of any non-respiratory

diseases it may cause. Awareness has improved over the last decade levels of knowledge remain low. Researchers in Australia also found out that smokers immediately indicated that they would avoid exposing both adults and children to their SHS after they were informed of the risk of SHS to non-smokers. (Evans 2011.)

Another strategy by Husten (2009) taking the community-based approach is summarized below.

Table 9. Community Preventive Service Task Force Recommendations for Interventions That Increase Tobacco Use Cessation. (Task Force on Community Preventive Services, 2005, Husten 2009)

Strong Evidence of Effectiveness
Increasing the unit price for tobacco products
Mass media education campaigns combined with other interventions
Health care provider reminder systems with provider education, with or without client education.
Sufficient Evidence of Effectiveness
Health care provider reminder systems
Reducing client out-of-pocket costs for effective cessation therapies
Smoke-free policies to reduce tobacco use among workers

Nursing organizations such as Canadian Nurses Association (CNA) also recommended a three-faceted strategy in the use of tobacco that includes:

- **Prevention** – to help the non-smokers from starting
- **Cessation** – to help people who quit smoking prevent relapse
- **Protection** – to protect non-smokers from secondhand smoke

It considers the provision of smoking cessation interventions to be a standard of nursing care and is widely recognized as an effective clinical practice. Helping to keep non-smokers from starting is the most important strategy of the three. The combination of Pharmacotherapy and counseling has also shown an increase in the cessation rate significantly. (CNA 2018.)

The 5A's framework (Ask, Advise, Assess, Assist, and Arrange) has also been widely recommended for smoking cessation. The 5 A's model (as shown in Table 10) is a short, goal-oriented way to address tobacco use more effectively with patients with the goal of meeting tobacco users' needs in terms of readiness to quit. The concept is summarized below.

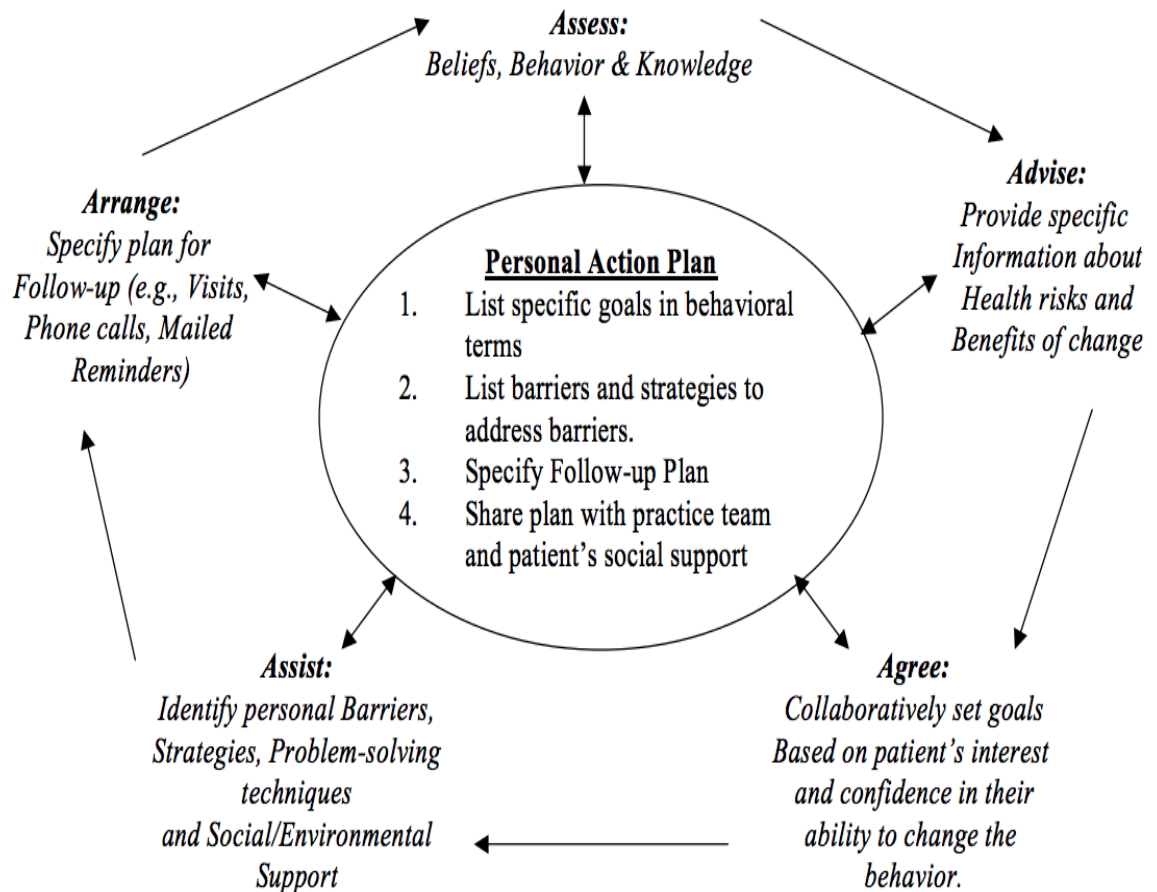


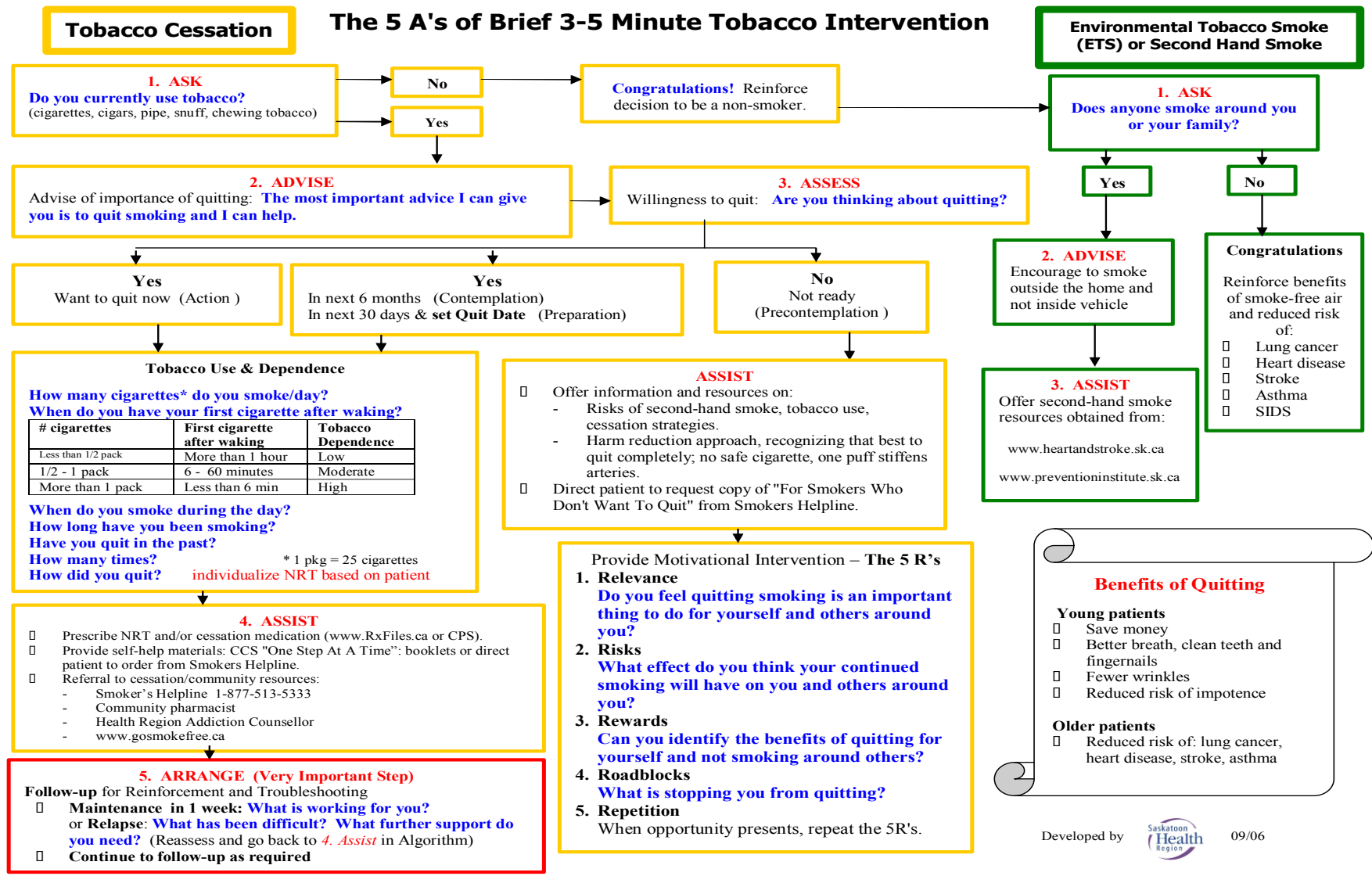
Figure 9. The 5A's concept model. (Glasgow 2002)

Table 10. The 5A's Change Concept. (Glasgow 2002)

THE FIVE A'S CHANGE CONCEPT			
	PATIENT LEVEL (Patient-Provider Interaction)	OFFICE ENVIRONMENT (Standard Operating Procedure)	COMMUNITY POLICY
ASSESS - Have patient periodically complete valid health behavior surveys and provide them with feedback.	<ul style="list-style-type: none"> - Assess patient's knowledge about their chronic condition. - Provide patient with personalized feedback and results. - Assess confidence and conviction regarding target behaviors. 	<ul style="list-style-type: none"> - To record behavior status for smoking, weight, exercise etc. -Add behaviors to the problem list for patient. - Inform staff to collect or update key behaviors status at each visit. 	<ul style="list-style-type: none"> - Work on state health department or other organizations to develop community health behavior survey - Perform needs assessment in partnership with other community groups
ADVISE - Provide relevant and specific recommendations for behavior change.	<ul style="list-style-type: none"> - Inform patient that behavioral issues are as important as taking medication. - Document behavior change advice in the form of a prescription. 	<ul style="list-style-type: none"> - Develop list of benefits of behavior change and risk reduction. - Develop list of common symptoms that quitting smoking can improve. - Arrange prompt system to remind health practitioners to advice behavior change. 	<ul style="list-style-type: none"> - Recognize and reinforce staff for documented advice to change behavior. - Recommend the reimbursement of the 5 A's Action Planning.

<p>AGREE</p> <ul style="list-style-type: none"> - Use shared decision-making strategies that include collaborative goal setting. 	<ul style="list-style-type: none"> - Have patient develop specific, measurable, feasible goal for behavior change. - Provide options and choices among possible self management goals. 	<ul style="list-style-type: none"> - Make sure patient goals are in chart and all team members refer to them. - Incorporate videos on patient role or choice into practice and have patients see prior to consultation. 	<ul style="list-style-type: none"> - Determine that goals were set in a collaborative fashion by developing assessment method. - Require or reimburse documentation of collaboratively set goals in medical records.
<p>ASSIST</p> <ul style="list-style-type: none"> - Include action planning and problem solving as an effective self management support strategies. - Help patients create specific strategies to address their issues of concern. 	<ul style="list-style-type: none"> - Help the patient develop strategies to address barriers to change. - Patient referral to evidence based education or behavioral counseling (individual or group). - Elicit patient's views and plans regarding potential resources and support within 	<ul style="list-style-type: none"> - Plan for the setting, specifically focusing on the 4s' (size, scope, scalability and sustainability) in planning any office restructuring. 	<ul style="list-style-type: none"> - Collaborate with community groups and referrals to develop Action Plans and communication avenues. - Evaluate adverse effects and quality of life for program revision and cost- benefit analysis.

	family and community.		
<p>ARRANGE</p> <ul style="list-style-type: none"> - Follow-up on action plans and referrals. - Partner with community groups to improve services and linkages and establish a two-way communication. 	<ul style="list-style-type: none"> - E-mail follow-up or brief letter restating plan and inviting questions. - Arrange for patient to contact specific community resources that could support their goals. - Follow-up with goals set in action plan at each non-acute visit. 	<ul style="list-style-type: none"> -Develop collaborative process that can facilitate communications and support with other practices. -Develop follow-up checklist to make sure follow-up is provided. -Include blank on action plan form for follow-up date. 	<ul style="list-style-type: none"> - Follow-up with community programs to see how many patients attended and to get information on their progress. -Recognize/Reward social and economic environment in which these health systems interventions occur. - Reimburse follow-up phone calls, e-mail contacts, etc., outside of face-to-face visit.



ASSIST

- Offer information and resources on:
 - Risks of second-hand smoke, tobacco use, cessation strategies.
 - Harm reduction approach, recognizing that best to quit completely; no safe cigarette, one puff stiffens arteries.
- Direct patient to request copy of "For Smokers Who Don't Want To Quit" from Smokers Helpline.

Provide Motivational Intervention – **The 5 R's**

- 1. Relevance**
Do you feel quitting smoking is an important thing to do for yourself and others around you?
- 2. Risks**
What effect do you think your continued smoking will have on you and others around you?
- 3. Rewards**
Can you identify the benefits of quitting for yourself and not smoking around others?
- 4. Roadblocks**
What is stopping you from quitting?
- 5. Repetition**
When opportunity presents, repeat the 5R's.

THE 5A'S TOBACCO INTERVENTION FLOWCHART.

Furthermore, International Society of Nurses Cancer Care's (ISNCC) recommendations in significantly reducing tobacco use were also taken into account and these are:

- 1) Nurses must be educated about the health effects of tobacco products, the different ways of prevention of tobacco use and scientific-based strategies for tobacco use dependence treatment.
- 2) Nurses must take an active role in supporting local, national and international tobacco control policy and legislation.
- 3) Nurses must ensure that tobacco use assessment, documentation and dependence treatment is an expected part of care in all cancer inpatient and outpatient treatment programs and protocols.
- 4) Nurses must discuss exposure to secondhand smoke at home and workplaces with patients and families, including strategies to create tobacco-free environments.
- 5) Nurses should become non-smoking role models for their own health and the health of their patients.
- 6) Nursing organizations should support cessation attempts by nurses and advocate for a tobacco-free workplace.
- 7) Nurses should corroborate with other healthcare organizations, and tobacco-control groups to strengthen and fund tobacco control at all levels, including by supporting nursing research on tobacco use, prevention and cessation interventions, and reduction of exposure to passive smoking in people with and at risk for cancer. (ISNCC 2015).

Nursing involvement in community action, promoting an environment free of tobacco smoke, helping patients quit, and supporting effective tobacco control policies is essential to solve this problem. Nurses must provide leadership in these efforts, along with other healthcare professionals. (ISNCC 2015.)

6 ETHICS AND VALIDITY

Research ethics is fundamental to research practice, nurse education and the development of evidence (Doody and Noonan 2016). In order to promote the pursuit of knowledge and truth, the authors made sure to follow ethical standards and adhere to the principles research code of conduct that The European Code of Conduct for Research Integrity and Finnish National Board on Research Integrity made as a guideline in conducting a research. The authors acknowledged the important contribution and intellectual properties of others by properly referencing their work in accordance to the Turku University of Applied Sciences' thesis guidelines. Efforts were made to ensure that the results of the thesis were both valid and reliable. The authors conducted the research in a fair and unbiased manner, did not falsify documents nor fabricate result materials by omitting or suppressing data without justification.

Ethical issues are important in all types of research and ethical considerations form a major element in a research. Ethics according to Resnik (2011) are professional codes of conduct that defines right or wrong and the process of data collection should be free from fabrications or falsifications and misinterpretation of research data should be avoided at all cost (Resnik 2011).

The validity of the research data and results were assessed by retrieving not only from one but from a number of previous literature. In this respect, findings of content analysis are rather contestable if based only on the multiple judgments of a single researcher. By involving several researchers into content analysis, validity and reliability of literature sampling and data analysis may be broadly enhanced.

According to Winterstein and Kimberlin (2008), validity is not a property in itself. Validity is the extent to which the interpretations of the data were warranted to its intended use. (Winterstein and Kimberlin 2008.) Content validity must also cover the domain comprehensively, has a fair representation, and the elements chosen for the research samples are addressed in depth. Ensuring adequate resources for the required research to be undertaken and selecting a suitable methodology for answering the research questions can minimize the threats to validity. (Cohen *et al.* 2007, 137-144.)

7 DISCUSSION

The purpose of this thesis was to explore the effects of passive smoking on non-smoking adults and how can nurses take an active role in the control of environmental tobacco smoke.

Passive smoking or Secondhand smoke is the smoke that comes from the burning end of the cigarette, pipe, or cigar the smoke that is exhaled by a smoker. Secondhand smoke is inhaled by adults and children who are near people who are smoking. Millions of children and adults are exposed to secondhand smoke each year, killing hundreds of non-smokers in the process. Passive smoking is associated with significant morbidity and mortality rate. It has been proven to cause serious cardiovascular and respiratory diseases to passive smokers and it increases the risk of getting lung cancer. Breathing in secondhand smoke even for a short time also harms the cardiovascular system and increases the risk of heart attack and stroke. The dangerous effects of passive smoking to non-smokers do not necessarily manifest immediately but can still show years after being exposed to secondhand tobacco smoke, and by then it would be too late.

As evidenced by multiple researches done in the past, cigarettes are highly addictive and quitting from smoking is easier said than done. As nurses, we may not be able to fully prevent passive smoking but we can help the patient modify the behavior. Therefore behavioral therapy when combined with pharmacotherapy is deemed to be effective in addressing smoking cessation. As health care providers, we should also be responsible in making the public aware about the dangers of passive smoking. All health professionals should also promote smoke-free policies, particularly where services are delivered so that patients will not be exposed to secondhand smoke in the health facilities. Since there is no safe level of exposure to secondhand smoke, air filters or ventilation systems just do not work to remove secondhand smoke from the air. The only effective way to prevent exposure to secondhand smoke is to eliminate smoking in all indoors. Smoke-free homes and smoke-free workplace policies are the best way to protect people from exposure to secondhand smoke. By having a smoke-free facility, health professionals can encourage patients to live in a smoke-free home and work in a smoke-free workplace, which will help them avoid exposure to environmental tobacco smoke.

Although the prevalence of passive smoking in western developed countries has significantly decreased due to aggressive anti-tobacco campaigns and strict implementation of anti-tobacco legislations, secondhand smoke in some Asian and African countries still remains a major health public concern. Furthermore, the health effects of e-cigarettes or vaping have not been well established due to insufficient scientific-based studies and researches available as of this writing. Thus, it would be beneficial if the future studies would concentrate on reducing secondhand smoke in developing countries and further research is needed to clarify the health effects of e-cigarettes or vaping. Information yielded by such studies can enable health care professionals to deliver more effective services against passive smoking.

8 CONCLUSION

This thesis was intended to explore the effects of passive smoking on non-smokers and how nurses can take active roles in the control of secondhand smoke. On the basis of the available studies and research data gathered for the purpose of this thesis, it is therefore concluded that:

1. Secondhand smoke exposure can increase a non-smoker's risk of getting lung cancer by up to 20-30%.
2. Sufficient evidence suggests a causal relationship between secondhand smoke exposure and increase risks of cardiovascular and respiratory diseases such as Coronary Heart Disease (CHD), Chronic Obstructive Pulmonary Disease (COPD), and stroke.
3. Insufficient but suggestive evidence infers a causal relationship between secondhand smoke exposure and increase risks of asthma, tuberculosis and Community Acquired Pneumonia(CAP).

Furthermore, we may not be able to fully prevent passive smoking as nurses but we can still take effective measures by:

1. Taking an active role in raising awareness about secondhand smoke through health education and health counseling.
2. Helping an active smoker to quit smoking using the 5A's model (Assess, Advice, Agree, Assist, Arrange.)
3. Promoting smoke-free environment, both at home and at workplace.
4. Acting as advocates to ban smoking and become non-smoking role models.

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APPENDIX A

A. RESEARCH TABLE

Author(s)/ Journal / Country	Title & Year	Aim & Purpose	Research Method	Sample & Place	Main results
Almirall, J., Serra-Prat, M., Bolibar, I., Palomera, E., Roig, J., Hospital, I., Carandell, E., Agusti, M., Ayuso, P., Estela, A., Torres, A. and the Study Group of Community-Acquired Pneumonia in Catalan Countries (PACAP)	Passive smoking at home is a risk factor for community-acquired pneumonia in older adults: A population-based case-control study (2014)	To assess whether ETS exposure at home is a risk factor for community-acquired pneumonia (CAP) in adults.	A population-based case-control study was designed to determine the risk factors for CAP including home exposure to secondhand smoke.	A population-based case-control study was designed in a Mediterranean area with 860 000 inhabitants >14 years of age. 1003 participants who had never smoked were recruited and the study sample included 471 patients with CAP and 532 controls who had never smoked.	Passive smoking at home is a risk factor for CAP in older adults (65 years or more).
Awawdi, K., Steiner, H., Green, M., and Zelber-Sagi, S.	Association between second-hand smoking and acute heart disease among Arab women with	To study the association between secondhand smoke and Coronary Heart	A matched case-control study was assessed among non-smoking Arab women. The control group was women without	A total of 146 women were included, the majority had type-2 diabetes and were overweight or obese.	Exposure to domestic passive smoking is independently associated with Coronary Heart Disease in Arab women.

	multiple factors (2015)	Disease in Arab women in Israel.	Coronary Heart Disease who were individually according to age and type-2 diabetes. The women were interviewed with structured questionnaires on exposure to secondhand smoke and on attitudes towards such exposure.		
Brenner, D., Hung, R.J., Tsao, MS., Shepherd, FA., Johnson, MR., Narod, S., Rubenstein, W., McLaughlin, JR.	Lung Cancer risk in never smokers: a population-based case-control study of epidemiologic risk factors (2010)	A case-control study was conducted in Toronto area to evaluate potential lung cancer risk factors including secondhand exposure, family history of cancer and history of previous respiratory	Unconditional logistic regression models were used to estimate the associations between exposures and lung cancer risk.	445 cases (35% of which were never smokers) were identified through 4 major tertiary care hospitals in metropolitan Toronto between 1997 and 2002 and were frequency matched on sex and ethnicity with 425 population controls and 523 hospital controls.	Increased lung cancer risk were associated with any previous exposure to occupational exposures OR never smokers, a previous diagnosis of emphysema, or a first degree family member with a previous cancer diagnosis before age 50 among never smokers.

		diseases, indoor air pollution, workplace exposures with special consideration given to never smokers.			
Cao, S., Yang, C., Gan, Y., and Lu, Z.	The Health Effects of Passive Smoking: An Overview of Systematic Reviews Based on Observational Epidemiological Evidence (2015)	To systematically summarize the available epidemiological evidence to identify the impact of secondhand smoke on health.	A systematic literature search of PubMed, Embase, Web of Science, and Scopus for meta-analyses was conducted through January 2015. Systematic reviews that investigated the association between ETS exposure and certain diseases were included. Quantitative outcomes of association between passive smoking and the risk of certain diseases were summarized.		Passive smoking appears not to be significantly associated with eight diseases or health problems, but significantly elevates the risk for eleven specific diseases or health problems, including cervical cancer, Neisseria meningitidis carriage, Streptococcus pneumoniae carriage, food allergy, and so on.

<p>Coogan, P., Castro-Webb, N. Yu, J., O'Connor, G., Palmer, J., Rosenberg, L. 2015.</p>	<p>Active and Passive Smoking and the Incidence of Asthma in the Black Women's Health Study (2015)</p>	<p>To assess the separate associations of active and passive smoking to the incidence of adult-onset asthma in the U.S. Black Women's Health Study.</p>	<p>Cox regression models were used to derive multivariable hazard ratios and 95% confidence intervals for former and current smoking and SHS exposure among nonsmokers compared with a reference category of never active or passive smokers.</p>	<p>Active smoking status was reported at baseline and updated on all follow-up questionnaires. SHS exposure during childhood, adolescence, and adulthood was ascertained in 1997. Asthma cases comprised women who reported doctor-diagnosed asthma with concurrent use of asthma medication.</p>	<p>Among 46,182 participants followed from 1995 to 2011, 1,523 reported incident asthma.</p>
<p>Evans, K., Sims, M., Judge, K., Gilmore, A.</p>	<p>Assessing the knowledge of the potential harm to others caused by second-hand smoke and its impact on protective behaviours at home (2011)</p>	<p>To examine peoples' knowledge of ETS-related illness in England overtime, identify the determinants of good knowledge and assess its importance in predicting ETS-</p>	<p>Statistical analysis of repeat cross-sectional data from the Omnibus Survey to explore the trends and determinants of knowledge of ETS-related illnesses and the determinants of ETS-protective behaviours.</p>		<p>Only 40% of smokers had good knowledge of ETS-related illnesses compared with 65% of never smokers. Smokers with better knowledge were more likely to abstain from smoking in a room with children and have smoke-free homes.</p>

		protective behaviours.			
Fischer, F., and Kraemer, A.	Meta-analysis of the Association between Second-hand Smoke exposure and Ischaemic Heart Diseases, COPD, and Stroke (2015)	The purpose of the study is to quantify the effects of ETS exposure and its relation to ischaemic heart diseases (IHD), chronic obstructive pulmonary diseases (COPD) and stroke.	A systematic literature review was conducted to identify articles dealing with the association between ETS and the three outcomes: IHD, COPD and stroke. 24 articles were included in a meta-analysis using a random effects model. Effect sizes stratified for sex and for both sexes combined were calculated.		For all three outcomes, the effect sizes were larger for women than for men. The risk factor of SHS exposure seems to be particularly important for COPD. A 66 % excess risk of COPD was calculated for people exposed to ETS for both sexes combined. No significant increase in the risk of getting Ischaemic Heart Disease (IHD) and stroke were noted.
Heo, S., and Lee, JT.	Disease burdens from the environmental tobacco smoke in Korean adults. International Journal of Environmental	An estimation of the disease burdens attributable ETS exposure in Korean adults in 2010 and analyzed the trend of that from 2005 to 2010.	Information on the study population from the 2010 Cause of Death Statistic was obtained and the ETS-attributable fraction using data from the Korean Community		The numbers of ETS-attributable deaths in female and male non-smokers were estimated to be 4.1 and 69.6 % of the numbers of deaths attributable to current smoke. The deaths attributable to ETS were larger in female than in

	Health Research (2015)		Health Survey and the Korean National Health and Nutrition Examination Survey was estimated.		male non-smokers. The ETS-attributable deaths increased slightly in the year 2005–2008 but decreased in 2009–2010.
Hori, M., Tanaka, H., Wakai, K., Sasazuki, S., and Katanoda, K.	Secondhand smoke exposure and risk of lung cancer in Japan: a systematic review and meta-analysis of epidemiologic studies (2016)	A systematic review and meta-analysis of the relationship between ETS smoke and lung cancer in Japanese non-smokers.	Potential confounding variables were accounted for and stratified analyses were carried out according to study design and publication year-	Relevant studies were collected from the MEDLINE and Ichushi Web databases using a combination of search terms and Medical Subject Headings. Eligible studies were extracted, and relative risks or odds ratios were identified to calculate the pooled risk estimates.	The results were stable across different subgroup analyses, including by study design, publication year, and when adjusting for confounding variables. Of the 12 populations included in meta-analysis, positive ETS smoke exposure-lung cancer associations were observed in 11, and an inverse association was found in the remaining 1.
Joseph, R., Daniel, C., Thind, H., Benitez, T., and Pekmezi, D.	Applying Psychological Theories to Promote Long-Term Maintenance of Health Behaviors (2016)	The purpose of the current article was to extend a previous review which described psychological theories used in intervention	Randomized trials or articles of physical activity, weight loss, tobacco cessation, and abstinence from excessive alcohol consumption that reported relevant	To be eligible, studies were required to explicitly state a psychological or behavioral health theory as an underpinning of intervention activities, focus on individuals ≥ 18 years of age, and report	Five behavioral health theories were referenced in studies evaluating long-term maintenance of physical activity, weight loss, and smoking cessation. These theories included: Self-Determination Theory, Theory

		research to motivate or initiate behavior change.	lifestyle behavior outcomes at ≥ 6 months post-completion of the intervention were searched.	an objective or self-reported outcome of the behavior/risk factor of interest.	of Planned Behavior, Social Cognitive Theory, Transtheoretical Model, and Social Ecological Model.
Johannessen, A., Bakke, P., Hardie, J., and Eagan, T	Association of Exposure to environmental tobacco smoke in childhood with chronic obstructive pulmonary disease and respiratory symptoms in adults (2012)	To examine the associations between childhood secondhand smoke exposure and adult COPD and respiratory illnesses.	Patients with COPD participated in the during 2006–2009 and analyses were stratified by gender. Participants performed spirometry and answered extensive questionnaires.	Patients with COPD participated in the during 2006–2009 and analyses were stratified by gender. Participants performed spirometry and answered extensive questionnaires.	The prevalence of childhood exposure to SHS was 61%. After adjustment, women who were exposed to SHS during childhood had a higher risk of COPD than those who were not exposed and secondhand smoke exposure during childhood was associated with respiratory illnesses among males.
Leung, C., Lam, T., Ho, K., Yew, W., Tam, C., Chan, W., Law, W., Chan, C., Chang, K., and Au, K.	Passive Smoking and Tuberculosis (2010)	To investigate the effect of secondhand tobacco smoke exposure on tuberculosis.	A cohort of female never-smokers aged 65 to 74 years living with their husband and followed up prospectively through linkage with the territory-wide	A cohort of female never-smokers aged 65 to 74 years living with their husband and followed up prospectively through linkage with the territory-wide tuberculosis notification registry and	Passive smoking accounted for 13.7% of active TB and for 18.5% of culture-positive tuberculosis in this cohort study.

			tuberculosis notification registry and death registry for tuberculosis using an identity card number as a unique identifier.	death registry for tuberculosis using an identity card number as a unique identifier.	
Li, B., Wang, L., Lu, MH., Mo, XF., Lin, FY, Ho, S., and Zhang, CX.	Passive Smoking and Breast Cancer Risk among Non-smoking Women: A Case Control Study in China (2015)	To evaluate the association between passive smoking and breast cancer risk among Chinese women.	A structured questionnaire was used to collect information on passive smoking history through personal interview by trained interviewers. Unconditional logistic regression models were used to estimate the association between secondhand smoke and breast cancer risk.	A hospital-based case-control study including 877 breast cancer cases and 890 controls, frequency-matched by age and residence, was conducted.	A positive association between passive smoking exposure and breast cancer risk was observed. Compared with women who were never exposed to passive smoking, women who were ever exposed had a higher breast cancer risk.
Mu, L., Liu, L., Niu, R., Zhao, B., Shi, J., Li, Y., Swanson, M., Sheider, W., Su, J.,	Indoor Air Pollutions and Risks of lung Cancer Among	To investigate indoor particulate matter level and various indoor air	A case-control study was conducted in Taiyuan, China, consisting of 399 lung	Eligible cases were lung cancer patients diagnosed in Shanxi Tumor Hospital between 2005 and 2007.	Among non-smoking women, lung cancer was strongly associated with multiple sources of indoor air pollution

Chang, SC., Yu, S., Zhang, ZF.	Chinese Female Non-smokers (2013)	pollution exposure and to examine their relationships with risk of lung cancer on non-smoking women in an urban Chinese population.	cancer cases (164 female non-smokers) and 466 controls (218 female non-smokers). Unconditional logistic regression models were used to calculate odds ratios and 95 % confidence intervals after age, education, annual income, and smoking adjustment.	A total of 399 cases (197 females and 202 males) with a response rate of 89%, and 466 controls (232 females and 234 males) were recruited in the study. All patients were interviewed at the hospital, and all controls were interviewed in community health service centers.	10 years ago, including heavy exposure to environmental tobacco smoke at work.
Patra, J., Bhatia, M., Suraweera, W., Morris, S., Patra, C., Gupta, P., Jha, P.	Exposure to Second-Hand Smoke and the Risk of Tuberculosis in Children and Adults: A Systematic Review and Meta-Analysis of 18 Observational Studies (2015)	To investigate the role of second-hand smoke (SHS) exposure as a risk factor for tuberculosis among children and adults.	A systematic literature search of Pubmed, Embase, Scopus, Web of Science and Google Scholar. 18 eligible studies were identified containing secondhand exposure and tuberculosis outcome data for inclusion in the meta-analysis.		Secondhand smoke exposure is associated with an increase in the relative risk of Latent tuberculosis and active TB after age control and contact with a TB patient. There was no significant association of SHS exposure with Latent TB was found.
Repace, JL.	Secondhand Smoke in Pennsylvania	Assessment of the air pollution,	Each area-monitored casino was sampled	Three Pennsylvania casinos (Mohegan Sun,	SHS-induced heart disease and lung cancer will cause an

	Casinos: A Study of Nonsmokers' Exposure, Dose, and Risk (2009)	ventilation, and nonsmokers' risk from secondhand smoke in Pennsylvania casinos exempted from a statewide smoke-free workplace law.	once and measurements for burning cigarette density, carbon dioxide inside and outside of the casinos as an index of ventilation, and pollutant concentration were obtained.	Philadelphia Park, and Harrah) and dose of secondhand smoke in 8 patrons for 3 casinos (The Meadows, Philadelphia Park and Presque Isle Downs).	estimated 6 Pennsylvania casino workers' deaths annually per 10000 at risk, 5-fold the death rate from Pennsylvania mining disasters.
Stayner, L., Bena, J., Sasco, A.J., Smith, R., Steenland K., Kreuzer M., and Straif, K.	Lung Cancer risk and workplace exposure to environmental smoke (2007)	To evaluate the association between workplace environmental tobacco smoke exposure and lung cancer.	Estimates of relative risk from the studies were analyzed by fitting the data to fixed and mixed effects models. Analyses of highly exposed workers and of the relationship between duration of exposure and lung cancer were also performed.	A meta-analysis data from 22 studies from multiple locations worldwide of workplace environmental tobacco smoke exposure and lung cancer risk.	The meta-analysis indicated a 24% increase in lung cancer risk among workers exposed to environmental tobacco smoke. A 2-fold increased risk was observed for workers classified as being highly exposed to environmental tobacco smoke. A strong relationship was observed between lung cancer and duration of exposure to environmental tobacco smoke.
Taylor, R., Najafi F., and Dobson, A.	Meta-analysis of studies of passive	To calculate a pooled estimate of	55 studies are included in the meta-analysis, of	Meta-analysis of studies by type of study and	A total of 55 studies, seven cohort and 48 case-control

	smoking and lung cancer: effects of study type and continent (2007)	relative risk of lung cancer associated with exposure to passive smoking in non-smoking women exposed to smoking spouses.	which, 7 are cohort studies, 25 population-based case-control and 23 non-population-based case-control studies. Twenty previously published meta-analyses are also reviewed.	continent, from 1981–2006.	studies are included in the meta-analysis. In 45 of these studies (82.0%) there is an increased risk for lung cancer among non-smoking women.
Öberg, M., Jaakkola, M., Woodward, A., Peruga A., Prüss-Ustün, A.	Worldwide burden of disease from exposure to second-hand smoke: a retrospective analysis of data from 192 countries (2011)	To estimated the worldwide exposure to SHS smoke and its disease burden in children and non-smokers in 2004.	The disease-specific relative risk estimates and area-specific estimates of people exposed to SHS were calculated, with data from 192 countries.		603,000 deaths were attributed to SHS smoke in 2004. The exposure caused deaths from IHD, asthma, lung cancer, and lower respiratory infections.

APPENDIX B

SMOKING HABITS OF THE POPULATION AGED 15 OR OVER IN THE EU MEMBER STATES BY SEX IN PERCENTAGE 2014.

	TOTAL				MEN				WOMEN			
	Non-smoker	Current smoker	Of which		Non-smoker	Current smoker	Of which		Non-smoker	Current smoker	Of which	
			Daily smoker	Occasional smoker			Daily smoker	Occasional smoker			Daily smoker	Occasional smoker
EU	76.0	24.0	19.2	4.7	71.3	28.7	23.2	5.5	80.5	19.5	15.5	4.0
Belgium	77.0	23.0	18.9	4.1	73.8	26.2	21.6	4.7	80.1	19.9	16.4	3.5
Bulgaria	65.2	34.8	28.2	6.5	56.7	43.3	36.4	7.0	73.2	26.8	20.7	6.2
Czech Republic	71.3	28.7	21.5	7.1	65.0	35.0	27.6	7.4	77.4	22.6	15.7	6.9
Denmark	79.1	20.9	13.8	7.1	77.6	22.4	15.3	7.1	80.6	19.4	12.4	7.0
Germany	78.3	21.7	15.9	5.8	75.2	24.8	17.9	6.8	81.2	18.8	14.0	4.9
Estonia	72.4	27.6	23.5	4.2	62.4	37.6	33.0	4.6	80.8	19.2	15.4	3.8
Ireland	:	:	:	:	:	:	:	:	:	:	:	:
Greece	67.4	32.6	27.3	5.3	60.6	39.4	33.8	5.6	73.6	26.4	21.4	5.0
Spain	74.7	25.3	23.0	2.4	69.6	30.4	27.6	2.9	79.5	20.5	18.6	1.9
France	71.7	28.3	22.4	5.8	67.6	32.4	25.8	6.6	75.5	24.5	19.4	5.1
Croatia	71.3	28.7	25.0	3.7	67.3	32.7	29.5	3.2	75.0	25.0	20.8	4.2
Italy	77.3	22.7	17.8	4.9	71.7	28.3	22.3	6.0	82.6	17.4	13.5	3.9
Cyprus	70.9	29.1	25.7	3.4	58.1	41.9	38.2	3.7	82.8	17.2	14.1	3.1
Latvia	70.5	29.5	24.6	4.9	56.9	43.1	37.0	6.0	81.4	18.6	14.6	4.0
Lithuania	75.0	25.0	20.4	4.6	59.7	40.3	33.9	6.4	87.7	12.3	9.2	3.1
Luxembourg	79.5	20.5	14.6	5.8	76.5	23.5	16.9	6.6	82.5	17.5	12.4	5.0
Hungary	72.5	27.5	25.8	1.7	66.5	33.5	31.6	1.9	77.8	22.2	20.8	1.5
Malta	75.9	24.1	20.1	4.0	72.4	27.6	23.3	4.2	79.4	20.6	17.0	3.7
Netherlands	74.8	25.2	19.1	6.0	71.2	28.8	21.7	7.1	78.4	21.6	16.7	5.0
Austria	70.0	30.0	24.3	5.7	67.1	32.9	26.5	6.4	72.8	27.2	22.1	5.1
Poland	73.9	26.1	22.7	3.4	67.5	32.5	28.8	3.7	79.7	20.3	17.2	3.1
Portugal	80.0	20.0	16.8	3.2	72.2	27.8	23.5	4.3	86.8	13.2	10.9	2.3
Romania	74.3	25.7	19.8	5.8	60.2	39.8	32.3	7.5	87.5	12.5	8.3	4.3
Slovenia	75.8	24.2	18.9	5.4	72.5	27.5	21.8	5.7	78.9	21.1	16.0	5.1
Slovakia	70.5	29.5	22.9	6.7	62.0	38.0	30.4	7.5	78.3	21.7	15.8	5.9
Finland	80.8	19.2	12.6	6.7	77.9	22.1	14.4	7.7	83.4	16.6	10.9	5.7
Sweden	83.3	16.7	9.8	6.9	82.6	17.4	9.2	8.1	84.0	16.0	10.3	5.6
United Kingdom	82.7	17.3	14.2	3.0	81.1	18.9	15.3	3.5	84.2	15.8	13.2	2.5
Norway	79.9	20.1	12.9	7.2	78.9	21.1	13.3	7.9	80.9	19.1	12.6	6.6
Turkey	67.5	32.5	27.3	5.2	52.6	47.4	41.8	5.6	82.1	17.9	13.1	4.8

Figures may not add up due to rounding.

: Data not available

The source dataset is available [here](#).

EFFECTS OF PASSIVE SMOKING

What is Secondhand Smoke (SHS)?

**SECONDHAND SMOKE IS THE SMOKE EXHALED BY
A SMOKER THAT COMES FROM A BURNING END OF
A CIGARETTE, PIPER OR CIGAR.**



Most of the smoke from a cigarette goes directly into the air. This is called **SIDESTREAM SMOKE**. Second-hand smoke is the mix of the mainstream smoke exhaled by the smoker and the 85% side stream smoke.

There are approximately 600 ingredients in a cigarette and when burned, it creates more than 7,000 chemicals. At least 69 of these chemicals are poisonous and are known to cause **CANCER**. Secondhand smoke has been classified as a human lung carcinogen since 1993.

SECONDHAND SMOKE IS A SERIOUS HEALTH RISK

- SHS EXPOSURE CAN INCREASE A NON-SMOKER'S RISK OF GETTING LUNG CANCER BY 20-30%.
- IT AGGREGATES ASTHMA
- INCREASES THE RISK OF CARDIOVASCULAR AND RESPIRATORY DISEASES SUCH AS CORONARY HEART DISEASE, CHRONIC OBSTRUCTIVE DISEASE AND STROKE.

“There is **NO SAFE LEVEL to Secondhand Tobacco Smoke Exposure”**

IF YOU ARE A SMOKER

AT HOME

Make your home smoke-free. If you smoke, do it outside and ask others to smoke outside too.

WHEN YOU'RE OUT

It is against the law to smoke in enclosed and substantially enclosed public places. This will help reduce exposure to SHS.

IN THE CAR

Smoking in confined spaces like in the car creates a very polluted environment. If you smoke, do it before you set off, take a smoke break on a longer journey.

AT WORK

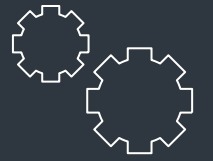
Research shows smokers smoke less when it is banned in the workplace. This also protects the health of both smokers and non-smokers.

IF YOU ARE A NON-SMOKER

- Let the smokers know to not smoke around do.
- Make your home and car smoke-free zones.
- Try to keep away from smoky places or people who are smoking.
- Tell your family and friends that you want to protect your family and ask for their support.

QUIT!

The best way to protect everyone from tobacco smoke is to give up smoking.



DID YOU KNOW?

40% of children, 33% of male non-smokers, and 35% of female non-smokers were exposed to secondhand smoke exposure worldwide.



ONLINE SOURCES:

<http://www.publichealth.hscni.net/>
<http://www.ashscotland.org.uk>
www.lung.org



Leaflet Made By:
Rowena Batnag
And
Junu Shrestha