DOI: http://dx.doi.org/10.22122/ijbmc.v9i4.393 Published by Vesnu Publications

International Journal of Body, Mind and Culture

Investigating the Effect of Smoking on the Incidence of Internal Diseases (A Review Paper)

A. Heri Iswanto[1], Ali Abdulhussain Fadhil[2], Md. Zahidul Islam[3], Ali K. Mohammed[4], Abduladheem Turki Jalil[5], Ali T. Khlaif[6], Yasser Fakri Mustafa[7], Hamzah H. Kzar[8], Moaed E. Al-Gazally[9], Narmin Beheshtizadeh[10]

[1] Department of Public Health, Faculty of Health Science, University of Pembangunan Nasional Veteran Jakarta, Jakarta, Indonesia
[2] College of Medical Technology/ Medical Lab techniques, ; Al-farahidi University/Iraq
[3] Assistant Professor, Ahmad Ibrahim Kulliyyah of Laws (AIKOL), International Islamic University Malaysia (IIUM), Kuala Lumpur, Malaysia
[4] Al-Nisour University College, Baghdad, Iraq
[5] Faculty of Biology and Ecology, Yanka Kupala State University of Grodno, Grodno, Belarus
[6] College of Pharmacy, Al-Ayen University, Thi-Qar, Iraq
[7] Department of Pharmaceutical Chemistry, College of Pharmacy, University of Mosul, Mosul, Iraq
[8] Department of Chemistry, College of Veterinary Medicine, Al-Qasim Green University, Al-Qasim, Iraq
[9] College of Medicine, University of Al-Ameed, Karbala, Iraq
[10] Department of Social Sciences, Faculty of Social and Economic Sciences, Al-Zahra University, Tehran, Iran

Corresponding Author: A. Heri Iswanto***; Department of Public Health, Faculty of Health Science, University of Pembangunan Nasional Veteran Jakarta, Jakarta, Indonesia***
Email: h.iswanto@upnvj.ac.id

Review Article

Abstract

Background: According to World Health Organization (WHO) estimates, there are currently 1.1 billion tobacco smokers worldwide. This study follows the need for change in the increasing trend of lifestyle-related diseases and the lack of extensive studies on the pattern of smoking.

Methods: In the current study, an electronic database search was conducted to identify studies that examined the impact of smoking on internal diseases from the beginning of February 2018 to the end of December 2021. After eliminating numerous articles based on their titles and abstracts, 273 articles pertinent to the study's objectives were selected. Due to the inadequacy of the target audience and the inclusion and exclusion criteria, 239 of the remaining articles were eliminated. The 44 remaining articles were examined more closely.

Results: Each cigarette produces more than 7,000 chemicals. Many of these substances are toxic, and about 69 of them can cause cancer. For every 15 cigarettes you smoke, a mutation occurs in the body. Mutations are the cause of cancer. Studies have shown a clear relationship between dose and response, with a sharp increase in the risk of arterial disease in heavy smokers. In countries where approximately 30% of the population smokes, 50% of arterial disease can be attributed to smoking.

Conclusion: Smoking increases the risk of cardiovascular disease (CVD) and lung disease, and leads to an increased risk of lung, throat, stomach, and bladder cancer, and many other cancers. One of the most important organs in the body that can be disrupted by smoking is the heart.

Keywords: Smoking; Cardiovascular disease; Lung cancer

Citation: Iswanto AH, Fadhil AA, Islam MZ, Mohammed AK, Jalil AT, Khlaif AT, et al. **Investigating the Effect of Smoking on the Incidence of Internal Diseases (A Review Paper).** Int J Body Mind Culture 2022; 9(4): 259-70.

Received: 20 Apr. 2022

Accepted: 30 Jul. 2022

Introduction

The issue of tobacco use is discussed as one of the major and increasing risk factors for diseases globally, especially in connection with non-communicable and chronic diseases such as respiratory diseases, cancer, and stroke. Together, these diseases account for 95% of about 60 million deaths and 44% of the total disease burden worldwide as of 2005. Tobacco is the world's leading cause of controllable death. In this regard, it is estimated that smoking causes 4.9 million deaths annually worldwide (Akhu-Zaheya & Shiyab, 2017). The World Health Organization (WHO) estimates that this number will rise to 10 million by 2030, and because half of the mentioned deaths occur in productive and middle-aged individuals, it can decrease the life expectancy of people aged 35-60 years by 20-30 years. Other estimates suggest that of the 3.2 billion smokers, millions will die within the next 45 years if there is no significant change in the current trend in tobacco use. Scientific evidence also indicates that smoking makes a smoker sick and that people living around the smoker are at risk. It is estimated that these people are 30% more likely to develop lung cancer than others. A study conducted in the United Kingdom estimated the death rate of people around smokers at more than 10 thousand a year (Mao, Huang, Wang, Wang, Li, & Yang, 2021). Moreover, smoking is the most important risk factor for preventable diseases and one of the important causes of premature death. It is estimated that, currently, 87% of deaths due to lung cancer and 85% of deaths due to obstructive pulmonary disease are caused by smoking. In addition to the lungs, smoking also affects the cardiovascular system, and 56% of deaths due to coronary artery disease (CAD) and 68% of deaths due to heart attack are also caused by smoking. It is noteworthy that many previous researches worldwide have reported that the prevalence of smoking is increasing in both sexes, especially among young people, i.e., the age of smoking is decreasing (Pinto, Pichon-Riviere, & Bardach, 2015).

Snow et al. (2019) showed that tobacco and substance use disorders affect high heart failure risk populations, including those of racial/ethnic minorities, lower socioeconomic status, younger age, and male sex. Enhanced screening for tobacco and substance use disorders in hospitalized heart failure patients may reveal opportunities for treatment and secondary prevention. Grender et al. (2021) showed that improving and expanding the implementation of evidence-based tobacco control policies at the most comprehensive level could significantly reduce the future incidence of lung cancer in Europe (Schwarz, Becker, Sahm, Horstkemper, Rousi, & Becker, 2017).

The present study follows the need for change in the increasing prevalence of lifestyle-related diseases, and the lack of extensive studies on the undesirable habit of smoking and lack of adequate epidemiological knowledge about it, especially about smoking patterns, because such studies help to identify the at-risk population, the trend of smoking in different age groups, and its adverse effects and provide the basis for targeted preventive planning at the level of primary health care.

Methods

A search of electronic databases was conducted in this review study to identify studies that examined the impact of smoking on internal diseases from the beginning of February 2018 to the beginning of December 2021. After removing many articles based on title and abstract, 273 articles were chosen that were relevant to the study's objectives. Due to the inadequacy of the target group and the inclusion and exclusion

criteria, 239 of the remaining articles were eliminated. Thus, 34 articles were scrutinized in greater depth.

These articles were found using the keywords the effect of tobacco and smoking on internal diseases and their exacerbation in the PubMed, ScienceDirect, and BioMed Central databases. The following individuals were included in the study: Interventional research Dissemination of electronic findings investigating the impact of smoking on internal diseases. Articles that only considered cigarette smoking were included in this study. The exclusion criteria included studies on the reduction of smoking through interventions regarding health behaviors in consumers and interventional studies on the reduction of smoking to prevent and reduce diseases like diabetes, asthma, depression, and others. To determine the quality of the articles in question, 2 researchers with no conflicts of interest and a common agreement and consensus on the inclusion and exclusion criteria reviewed the articles and eliminated those that did not meet these criteria.

Results

When an individual's blood sugar level rises above normal, he/she develops diabetes. The pancreas is an organ in the body that produces the hormone insulin, which helps the body produce glucose to reach the body's cells (Kwon, Yang, & Lee, 2013). When a person has diabetes, their body cannot produce enough insulin or use the insulin produced in the pancreas properly. Therefore, less glucose reaches the cells, and instead, this glucose accumulates in the blood, which causes diabetes. There are two types of diabetes, type 1 diabetes and type 2 diabetes (Grabowska, Targowski, & Jahnz-Rozyk, 2006). Type 2 diabetes is the most common type of diabetes in adults and is observed in 90% of people with diabetes (Kazemzadeh, Manzari, & Pouresmail, 2017). Smoking is one of the causes of diabetes, and causes type 2 diabetes. Smoking also increases the risk of diabetes itself. Smokers are about 30 to 40% more likely to develop type 2 diabetes (Huttunen, Heikkinen, & Syrjanen, 2011). Moreover, diabetics who smoke have more difficulty controlling their diabetes and insulin intake, and no matter what type of diabetes a person has, smoking exacerbates diabetes and makes it harder to control. Smoking in a diabetic causes heart and kidney problems, slowing of blood flow in the legs that can lead to infection and ulcers, and in turn, to amputation or amputation of the leg, retinopathy (a type of eye disease that causes blindness), peripheral neuropathy (damage to the nerves in the limbs that causes numbness, pain, weakness, etc.) (Morita, 2007).

Research has shown that one of the most dangerous harms of smoking for diabetics is that diabetics who smoke are more likely to die, and this is a very significant link between diabetes and smoking. The fact is that, in people with diabetes, the toxic chemical compounds in cigarettes attack blood vessels more than others. Smoking presents an extra risk for the development of vascular complications in these patients, contributing to increased cardiovascular morbidity and mortality. Studies show that diabetics find it difficult to quit smoking due to the high social and psychological stress they experience. Little research has been performed on the smoking of diabetics. In one part, the prevalence of smoking in diabetic patients was studied by analyzing previous documents. The prevalence of smoking in diabetics is significantly higher than the prevalence in the general public. Unfortunately, smoking is also common among younger diabetics, while this group contributes a great deal to their health by quitting smoking. Details are presented in tables 1 and 2.

Table 1. Prevalence of smoking in various groups of diabetic patients

Group	Number of patients	Number of smokers	Prevalence of smoking
IDDM And NIDDM patients	13940	4542	33
< 30 years	183	51	28
≥30 years	808	260	32
Men	4140	1897	46
Men < 30 years	63	20	32
Men ≥ 30 years	356	142	40
Women	4482	1106	25
Women < 30 years	43	24	56
Women ≥ 30 years	452	118	26
IDDM patients	4264	1769	41
Men	1578	789	50
Women	1414	524	37

IDDM: Insulin-dependent diabetes mellitus; NIDDM: Non-insulin-dependent diabetes mellitus

The assessment of the molecular and biochemical composition of saliva and the study of structural and functional changes in its compounds due to various factors such as cigarette smoke can be very important and can be used in the prevention, diagnosis, and treatment of various oral diseases. Most of the biochemical compounds in saliva in terms of weight are proteins, which are mainly present in the form of glycoproteins. Alpha-amylase is one of the most important enzymatic compounds in saliva. The chemical compounds in cigarette smoke, including saturated and unsaturated aldehydes, can combine with enzymes and thiol-rich compounds and cause structural changes and changes in the function of various biochemical molecules in saliva. According to some studies, smoking and nicotine may reduce the activity of several enzymes, including alpha-amylase, in saliva. The response to treatment of oral diseases is somewhat different in smokers and non-smokers and, in some cases, a significant difference has been observed in the concentration of salivary biochemical compounds in these groups.

Side effects of smoking include damage to the heart and arteries. Smoking affects the arteries that carry blood to the heart and other parts of the body. Smoking reduces the amount of oxygen in the blood and causes damage to the walls of blood vessels. Smoking contributes to the development of atherosclerosis. Atherosclerosis occurs when blood vessels become narrowed and blocked. Finally, it reduces the amount of blood and oxygen in the body. The chemicals in tobacco smoke damage blood cells. Smoking can also damage heart function and the function and structure of blood vessels. It is obvious that, this damage increases the risk of atherosclerosis. Cardiovascular disease (CVD) occurs if plaque forms in the arteries of the heart. Over time, this condition can lead to heart failure, heart attack, arrhythmia, or even death. Smoking is a major risk factor for heart disease. The side effects of smoking and other risk factors such as poor health, high blood pressure, and overweight or obesity increase the risk of heart disease.

Smoking contains thousands of chemicals; the most important and harmful substances are nicotine and carbon monoxide. Nicotine is an addictive drug that affects brain and muscle activity and raises the blood pressure.

Table 2. Prevalence of smoking in the general population

Group	Number of patients	Number of smokers	Prevalence of smoking
Both men and women	64550	17594	27
Men	2651	1308	49
Women	3115	833	27

Carbon monoxide is a toxic gas that replaces oxygen in the blood and reduces the blood's ability to carry oxygen to the heart and other parts of the body (Smith & Fenske, 1996).

Any amount of smoking can damage the arteries of the heart. Smoking poses a greater risk to the heart and blood vessels in some people, such as women taking birth control pills and people with diabetes. Exposure to secondhand smoke can also damage the arteries of the heart. Cigarette smoke contains many harmful chemicals that greatly increase the risk of heart attack and death (Lippi & Henry, 2020). Cigarette smoke also increases the risk of heart disease in children and adolescents because it lowers high-density lipoprotein cholesterol in the blood, increases blood pressure, damages the tissues of the heart, and damages the lungs, especially in premature infants with respiratory distress syndrome (RDS) and asthma (Sales et al., 2019).

No matter how much or how long you smoke, it is in your best interest to quit. Quitting smoking reduces the risk of heart disease. Over time, the risk of developing atherosclerosis and blood clots also decreases. If you smoke and already have heart disease, quitting reduces the risk of sudden.

Some previous studies have investigated communities that have banned smoking in workplaces and public places (Bunch, 2022; Ni, Shi, & Qu, 2020; Santos et al., 2018). The results of these studies indicated that the number of heart attacks in these communities is very low. The researchers believe that these results are due to reduced smoking and reduced exposure to secondhand smoke. Among people with CVD, smoking cessation greatly reduces the risk of cardiovascular attack and cardiac death. In many researches, this risk reduction was 50% or more. The risk of developing atherosclerosis and smoking-related blood clots decreases after quitting. Quitting smoking can reduce your risk of heart disease by as much as or more than using commonly used medications, including aspirin, statins, beta-blockers, and ACE inhibitors (Lowe, Zein, Hatipoglu, & Attaway, 2021).

Smoke from cigarettes, hookahs, pipes, or any other type of tobacco can damage the body, but the damages to the lungs are much greater in people with asthma. Tobacco smoke is a strong stimulant for asthma symptoms. Smoking is an independent risk factor for pulmonary tuberculosis. Most studies have shown the effect of smoking on the weakening of the body's defenses. Smoking disrupts the function of alveolar macrophages and stimulates them to trigger a local inflammatory response. Nicotine suppresses the supply of antigens which produce a specific immune response. As a result, specific defenses of the body are disrupted (Gaur, Kasliwal, & Gupta, 2012).

When a person inhales cigarette smoke in any way, irritants are absorbed through the moist airway. These substances can lead to an asthma attack in people with asthma. In addition, cigarette smoke damages small tissues that look like hair and are called eyelashes. Typically, cilia expel dust and mucus from the airways. Tobacco smoke damages these lashes and reduces their efficiency, thus causing dust and mucus to accumulate in the airways. Smoke also causes the lungs to produce more mucus than usual. As a result, the accumulation of this mucus in the airways can trigger an asthma attack.

A person who does not smoke, but inhales environmental tobacco smoke (ETS) takes two types of smoke into their lungs, the smoke from burning smoking and the smoke emitted by the smoker. Inhaling secondhand smoke, commonly referred to as "passive smoke," may be more dangerous than smoking. This is because the smoke from the burning end of a cigarette contains substances such as tar, carbon monoxide, and nicotine, and is more dangerous than the smoke that the smoker himself inhales.

Cigarette smoke is especially dangerous for people with asthma. A person with asthma who is exposed to secondhand smoke is more likely to experience symptoms such as wheezing, coughing, and shortness of breath.

One of the reasons for the increase in cancer is smoking. Smoking cigarettes and hookahs causes various cancers in the body that are often irreversible. Not smoking is the greatest factor in the prevention of various cancers. The chemicals in cigarette smoke enter the bloodstream and can then affect the whole body, which is why smoking causes a variety of cancers (Takase et al., 2021).

Research shows that for every 15 smokers who smoke, a change in a person's DNA can cause a cancer cell to grow in the body (Sarthak, 2020). The best way to reduce your risk of cancer is to quit smoking altogether. The link between smoking and cancer is well known, and research suggests that smoking can cause at least 15 types of cancer. Cancers caused by smoking in the body are very sensitive and dangerous. Lung cancer is one of the cancers that can be caused by smoking and can affect a person (Miyazaki et al., 2022). Smoking causes other cancers in the body, including oral cancer, throat cancer, upper throat cancer, cancer of the nose and sinuses, throat cancer, cancer of the esophagus, and liver, pancreas, stomach, kidney, bowel, ovarian, bladder, and cervical cancer, and some blood cancers (Girkantaite & Andrejevaite, 2019).

Some of the harmful chemicals in tobacco smoke damage DNA. DNA is present in all cells of the body and controls how cells behave. If DNA is damaged, it can adversely affect cells and cause overgrowth as well as excessive division of the damaged cells. The chromium in tobacco smoke can attach harmful chemicals to DNA. This makes it easier for damaged cells to turn into cancer cells (Arpacioglu, Unubol, Erzincan, & Bilici, 2019). Moreover, the chemicals in tobacco smoke damage the immune system, which is responsible for eliminating toxins, which is why smokers are less able to eliminate toxic chemicals than other people. Toxins in cigarette smoke can weaken a person's immune system and make it harder to kill cancer cells (Palmer et al., 2018). When this happens, cancer cells grow without stopping. It is generally reported that 9 out of 10 lung cancers are caused by smoking or exposure to secondhand smoke. Although there are various treatments for lung cancer, it can be said that this type of cancer is the most important cause of death due to cancer (Wang, Ji, & Rahman, 2021).

Cigarette smoke contains harmful chemicals that can be harmful to both smokers and non-smokers. Breathing even a small amount of tobacco smoke can be very dangerous. There are more than 7,000 chemicals in tobacco smoke, at least 250 of which are harmful, including hydrogen cyanide, carbon monoxide, and ammonia.

Smoking is a very important factor in the incidence and acceleration of osteoporosis in smokers and non-smokers exposed to secondhand smoke. Osteoporosis is a disease that weakens bones and increases the risk of bone fractures. The severity of this disease is directly related to aging and is more common in women than men. There are several reasons why smoking is bad for your bones. Smoking increases the concentration of blood calcium in the body, and changes its absorption and storage in the bones by altering the permeability of cell membranes. Older people who smoke are 40-30% more likely to have a pelvic fracture than their non-smoking peers. Smoking reduces blood flow to the bones (Guo, 2020). Cigarette nicotine reduces the activity of bone marrow cells. Smoking reduces the absorption of calcium from food. Smoking lowers estrogen in women (estrogen causes strong bones in women). The rupture of the rotator cuff in the shoulder of smokers is almost twice as large as that of non-smokers. This is because tendons in smokers lose their

quality. Smokers are one and a half times more likely than non-smokers to have bursitis and tendonitis around the joints (Gallus, Lugo, & Gorini, 2020).

Discussion

Smoking can lead to infertility in both men and women. Erectile dysfunction in men and pregnancy complications also increase with smoking. Chemicals (such as nicotine, cyanide, and carbon monoxide) in cigarette smoke accelerate the destruction of eggs. Unfortunately, once the eggs are destroyed, they cannot be reproduced or replaced. This means that menopause occurs 1 to 4 years earlier in women smokers compared to non-smokers. In men who smoke, smoking is associated with a decrease in sperm count, low sperm motility, and an increase in abnormal sperm count, reduced sperm quality.

The fertility of women smokers is lower than that of non-smokers, so that the infertility rate of women and men smokers is almost twice that of non-smokers. The risk of fertility problems increases with the number of daily smoking sessions. Assisted reproductive therapies such as IVF may be effective in reducing the effects of smoking on fertility (Zheng, Ji, Dong, & Chang, 2018). Women who smoke need more ovarian stimulants during IVF, but they still have fewer eggs during ovulation and are 30% less likely to become pregnant than IVF patients who do not smoke (Mazıcan & Yarar, 2018). As smoking damages eggs and sperm, abortions and birth defects are more common in the fetuses of smokers. Even smokeless tobacco can increase the rate of miscarriage. The prevalence of chromosomal abnormalities such as Down syndrome is higher in women who smoke than in non-smoking mothers. In women smokers, the rate of ectopic pregnancy and preterm delivery is also higher (Ramotowski, Gurbel, Tantry, & Budaj, 2019).

Studies have shown that men whose mothers smoked half a pack (or more) a day had lower sperm counts. In addition, smoking during pregnancy can lead to fetal growth retardation and being underweight before birth. These children are at greater risk of lifelong medical problems (such as diabetes, obesity, and CVD). Children whose parents smoke are at higher risk of sudden infant death syndrome and asthma (Krzyścin, Napierała, Bręborowicz, Florek, & Sowińska-Przepiera, 2022).

The toxins in nicotine smoke cause the breakdown of auditory hair cells and disrupt the blood supply to the inner ear, resulting in hearing loss and hearing loss. Furthermore, due to the reduction in blood oxygen due to nicotine and carbon dioxide, the function of the auditory system is impaired. Researchers have found that the risk of hearing loss among smokers is about 70% higher than other people. Studies also show that exposure to secondhand smoke increases the risk of ear infections. Exposure to secondhand smoke causes fluid buildup in the middle ear, recurrent infections, and hearing loss (Russo et al., 2022).

Currently, smoking is thought to pose a separate risk called Epstein-Barr virus (EBV), which interacts with this factor, almost doubling the risk of developing non-steroidal anti-inflammatory drugs (NSAIDs). There is a direct relationship between consumption and the incidence of inflammation; people who have smoked for 25 years or more are at a higher risk of developing MS than people who have never smoked (Ahmed et al., 2021). In addition to setting the stage for these cancers, smoking causes a more severe secondary progression of MS by altering the relapsing-remitting period (Babinets & Kvasnitska, 2019).

The more a person smokes, the greater is the brain damage seen on magnetic resonance imaging (MRI) in patients with inflammatory bowel disease (IBD). Disability

is also more common in smokers, but may be prevented, at least in part, by quitting. Smoking may also prevent the treatment of IBD because it increases the production of antibodies against the beta-interferon molecules used to treat the disease. Therefore, many epidemiological studies suggest that smoking is one of the main environmental factors in the development of IBD. The average interval between the onset of smoking and clinical IBD development is about 15 years (Wieczorek et al., 2022).

Nicotine is known to be an immunosuppressive agent and stimulates the glycoprotein in tobacco's immune system, which may explain the increase in autoimmune phenomena in smokers, such as rheumatoid arthritis, systemic lupus erythematosus (SLE), and Crohn's disease. Microcirculation is defined as the flow of blood that carries blood to smaller vessels within the body's tissues. Nicotine increases this flow in the brain and increases the likelihood of permeable solutions entering the blood-brain barrier. According to research, leakage in the blood-brain barrier is thought to be an important factor in the onset of inflammation (R. Wang et al., 2019).

Conclusion

Smoking is one of the most important modifiable health risk factors worldwide, causing significant mortality due to cardiovascular accidents and lung problems. A new US Department of Health report on smoking states that new research shows that smoking, in addition to what is thought to be the cause of more diseases, second, the risk of lung cancer due to the prevalence of smoking and other diseases such as type 2 diabetes, muscle wasting in old age, male sexual dysfunction, arthritis, and osteoarthritis play an important role. Smoking, while weakening the immune system, can exacerbate respiratory illnesses such as asthma, and in some cases, the fetus is affected by smoking. Today, the role of cigarettes in diseases such as lung cancer and heart failure has increased compared to the previous 50 years. According to experts, the reason for this is the change in the way of making cigarettes and materials in cigarettes. In the 50 years since the first reports on the dangers of smoking were published, awareness of its implications for public health and its detrimental effects on the human body has increased, but unfortunately, the necessary measures to reduce smoking have not been taken worldwide.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

None.

References

Ahmed, N., Arshad, S., Basheer, S. N., Karobari, M. I., Marya, A., Marya, C. M. et al. (2021). Smoking a dangerous addiction: A Systematic review on an underrated risk factor for oral diseases. *Int J Environ.Res Public Health*, *18*(21). doi:ijerph182111003 [pii];10.3390/ijerph182111003 [doi]. Retrieved from PM:34769523

Akhu-Zaheya, L. M., & Shiyab, W. Y. (2017). The effect of short message system (SMS) reminder on adherence to a healthy diet, medication, and cessation of smoking among adult patients with cardiovascular diseases. *Int J Med Inform.*, *98*, 65-75. doi:S1386-5056(16)30269-6 [pii];10.1016/j.ijmedinf.2016.12.003 [doi]. Retrieved from PM:28034414

Arpacioglu, S., Unubol, B., Erzincan, E., & Bilici, R. (2019). Results of smoking cessation clinic in erenkoy mental and neurological diseases training and research hospital: An

investigation into the effects of cognitive behavioral intervention and pharmacotherapy. *ADDICTA: The Turkish Journal on Addictions, 6*(S4), 295-315.

Babinets, L. S., & Kvasnitska, P. (2019). Quality of life in patients with comorbidity of chronic pancreatitis and chronic obstructive pulmonary disease in presence of smoking. *Infusion & Chemotherapy*,(4), 18-22.

Bunch, T. J. (2022). Brain health in patients with atrial fibrillation-another reason to quit smoking now. *JAMA.Netw.Open., 5*(6), e2217141. doi:2793368 [pii];10.1001/jamanetworkopen.2022.17141 [doi]. Retrieved from PM:35704323

Gallus, S., Lugo, A., & Gorini, G. (2020). No double-edged sword and no doubt about the relation between smoking and COVID-19 severity. *Eur.J Intern Med, 77*, 33-35. doi:S0953-6205(20)30252-1 [pii];10.1016/j.ejim.2020.06.014 [doi]. Retrieved from PM:32564904

Gaur, K., Kasliwal, N., & Gupta, R. (2012). Association of smoking or tobacco use with ear diseases among men: a retrospective study. *Tob.Induc.Dis., 10*(1), 4. doi:1617-9625-10-4 [pii];10.1186/1617-9625-10-4 [doi]. Retrieved from PM:22471960

Girkantaite, Z., & Andrejevaite, V. (2019). Challenge for a cardiologist: how to help a patient to quit smoking effectively? *Redakcijos skiltis, 4*(87), 19-28.

Grabowska, P., Targowski, T., & Jahnz-Rozyk, K. (2006). Evaluation of quality of life and knowledge about tobacco smoking toxicity among patients hospitalized in Department of Pneumonology. *Przegl.Lek., 63*(10), 1071-1074. Retrieved from PM:17288220

Guo, F. R. (2020). Active smoking is associated with severity of coronavirus disease 2019 (COVID-19): An update of a meta-analysis. *Tob.Induc.Dis., 18*, 37. doi:10.18332/tid/121915 [doi];37 [pii]. Retrieved from PM:32382258

Huttunen, R., Heikkinen, T., & Syrjanen, J. (2011). Smoking and the outcome of infection. *J Intern Med, 269*(3), 258-269. doi:10.1111/j.1365-2796.2010.02332.x [doi]. Retrieved from PM:21175903

Kazemzadeh, Z., Manzari, Z. S., & Pouresmail, Z. (2017). Nursing interventions for smoking cessation in hospitalized patients: A systematic review. *Int Nurs Rev., 64*(2), 263-275. doi:10.1111/inr.12320 [doi]. Retrieved from PM:27933638

Krzyścin, M., Napierała, M., Bręborowicz, G., Florek, E., & Sowińska-Przepiera, E. (2022). 126 Effects of active and passive smoking during pregnancy on the blood flow in uterine artery in second trimester of pregnancy in young women. *Eur J Obstet Gynecol Reprod Biol, 273*, e53.

Kwon, J. W., Yang, Y. H., & Lee, B. K. (2013). Study on a Usage of Smoking Preparations, Fumigant and Buccal Preparations in [Dongeuibogam]. *The Journal of Korean Medicine Ophthalmology and Otolaryngology and Dermatology, 26*(3), 20-35.

Lippi, G., & Henry, B. M. (2020). Active smoking is not associated with severity of coronavirus disease 2019 (COVID-19). *Eur.J Intern Med, 75*, 107-108. doi:S0953-6205(20)30110-2 [pii];10.1016/j.ejim.2020.03.014 [doi]. Retrieved from PM:32192856

Lowe, K. E., Zein, J., Hatipoglu, U., & Attaway, A. (2021). Association of smoking and cumulative pack-year exposure with COVID-19 outcomes in the Cleveland Clinic COVID-19 Registry. *JAMA.Intern Med, 181*(5), 709-711. doi:2775677 [pii];10.1001/jamainternmed.2020.8360 [doi]. Retrieved from PM:33492361

Mao, Y., Huang, P., Wang, Y., Wang, M., Li, M. D., & Yang, Z. (2021). Genome-wide methylation and expression analyses reveal the epigenetic landscape of immune-related diseases for tobacco smoking. *Clin Epigenetics., 13*(1), 215. doi:10.1186/s13148-021-01208-0 [doi];10.1186/s13148-021-01208-0 [pii]. Retrieved from PM:34886889

Mazıcan, N., & Yarar, E. (2018). Smoking habits and effects in a pulmonary outpatient clinic in Agri. *To. Induc Dis, 16*(3).

Miyazaki, Y., Niino, M., Sakushima, K., Takahashi, E., Naganuma, R., Amino, I. et al. (2022). Association of smoking and generalized manifestations of Myasthenia Gravis. *Intern Med, 61*(11), 1693-1698. doi:10.2169/internalmedicine.8460-21 [doi]. Retrieved from PM:34744112

Morita, A. (2007). Tobacco smoke causes premature skin aging. *J Dermatol.Sci*, *48*(3), 169-175. doi:S0923-1811(07)00321-0 [pii];10.1016/j.jdermsci.2007.06.015 [doi]. Retrieved from PM:17951030

Ni, Y., Shi, G., & Qu, J. (2020). Indoor PM2.5, tobacco smoking and chronic lung diseases: A narrative review. *Environ.Res*, *181*, 108910. doi:S0013-9351(19)30707-8 [pii];10.1016/j.envres.2019.108910 [doi]. Retrieved from PM:31780052

Palmer, M., Sutherland, J., Barnard, S., Wynne, A., Rezel, E., Doel, A. et al. (2018). The effectiveness of smoking cessation, physical activity/diet and alcohol reduction interventions delivered by mobile phones for the prevention of non-communicable diseases: A systematic review of randomised controlled trials. *PLoS.One.*, *13*(1), e0189801. doi:10.1371/journal.pone.0189801 [doi];PONE-D-17-28103 [pii]. Retrieved from PM:29304148

Pinto, M. T., Pichon-Riviere, A., & Bardach, A. (2015). The burden of smoking-related diseases in Brazil: mortality, morbidity and costs. *Cad.Saude.Publica.*, *31*(6), 1283-1297. doi:S0102-311X2015000601283 [pii];10.1590/0102-311X00192013 [doi]. Retrieved from PM:26200375

Ramotowski, B., Gurbel, P. A., Tantry, U., & Budaj, A. (2019). Smoking and cardiovascular diseases: paradox greater than expected? *Pol.Arch Intern Med*, *129*(10), 700-706. doi:10.20452/pamw.14931 [doi]. Retrieved from PM:31418753

Russo, C., Walicka, M., Caponnetto, P., Cibella, F., Maglia, M., Alamo, A. et al. (2022). Efficacy and safety of varenicline for smoking cessation in patients with type 2 diabetes: A Randomized Clinical Trial. *JAMA.Netw.Open.*, *5*(6), e2217709. doi:2793375 [pii];10.1001/jamanetworkopen.2022.17709 [doi]. Retrieved from PM:35727580

Sales, M. P. U., Araujo, A. J., Chatkin, J. M., Godoy, I., Pereira, L. F. F., Castellano, M. V. C. O. et al. (2019). Update on the approach to smoking in patients with respiratory diseases. *J Bras Pneumol.*, *45*(3), e20180314. doi:S1806-37132019000300400 [pii];10.1590/1806-3713/e20180314 [doi]. Retrieved from PM:31271604

Santos, A., Oliveira, I., Carvalho, J., Campanha, R., Guimarães C, Fradinho, M. et al. (2018). Smoking cessation program: Where do our patients come from?

Sarthak, S. (2020). A cross sectional study on risk factors, smoking and hypertension of cardiovascular diseases among adult population in Urban Slum Area, Bhubaneswar, Odisha. *Indian J Public Health Res Dev*, *11*(5), 430-433.

Schwarz, F., Becker, K., Sahm, N., Horstkemper, T., Rousi, K., & Becker, J. (2017). The prevalence of peri-implant diseases for two-piece implants with an internal tube-in-tube connection: a cross-sectional analysis of 512 implants. *Clin Oral.Implants.Res*, *28*(1), 24-28. doi:10.1111/clr.12609 [doi]. Retrieved from PM:26178415

Smith, J. B., & Fenske, N. A. (1996). Cutaneous manifestations and consequences of smoking. *J Am.Acad Dermatol.*, *34*(5 Pt 1), 717-732. doi:S0190-9622(96)90003-1 [pii];10.1016/s0190-9622(96)90002-x [doi]. Retrieved from PM:8632065

Takase, H., Machii, M., Nonaka, D., Ohno, K., Takayama, S., Sugiura, T. et al. (2021). Effects of smoking on central blood pressure. *J Hypertens*, *39*, e232.

Wang, Q., Ji, X., & Rahman, I. (2021). Dysregulated metabolites serve as novel biomarkers for metabolic diseases caused by E-cigarette vaping and cigarette smoking. *Metabolites.*, *11*(6). doi:metabo11060345 [pii];10.3390/metabo11060345 [doi]. Retrieved from PM:34072305

Wang, R., Jiang, Y., Yao, C., Zhu, M., Zhao, Q., Huang, L. et al. (2019). Prevalence of tobacco related chronic diseases and its role in smoking cessation among smokers in a rural area of Shanghai, China: a cross sectional study. *BMC Public Health*, *19*(1), 753. doi:10.1186/s12889-019-7110-9 [doi];10.1186/s12889-019-7110-9 [pii]. Retrieved from PM:31196049

Wieczorek, M., Gwinnutt, J. M., Ransay-Colle, M., Balanescu, A., Bischoff-Ferrari, H., Boonen, A. et al. (2022). Smoking, alcohol consumption and disease-specific outcomes in rheumatic and musculoskeletal diseases (RMDs): Systematic reviews informing the 2021 EULAR recommendations for lifestyle improvements in people with RMDs. *RMD.Open.*, *8*(1). doi:rmdopen-2021-002170 [pii];10.1136/rmdopen-2021-002170 [doi]. Retrieved from PM:35351808

Zheng, Y., Ji, Y., Dong, H., & Chang, C. (2018). The prevalence of smoking, second-hand smoke exposure, and knowledge of the health hazards of smoking among internal migrants in 12 provinces in China: a cross-sectional analysis. *BMC Public Health*, *18*(1), 655. doi:10.1186/s12889-018-5549-8 [doi];10.1186/s12889-018-5549-8 [pii]. Retrieved from PM:29793454