

Impact of Tobacco on Chronic Diseases and Coping Strategies

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Abstract. People's physical and mental health are affected by chronic diseases in varied degrees, including chronic lung diseases, cardiovascular disorders, and metabolic diseases. Chronic conditions that are not controlled and are left untreated for an extended length of time can result in psychological issues including mood disorders and place an increased strain on families and society. Finding the appropriate intervention targets and understanding the disease's pathogenic causes and mechanisms are now major concerns for society. With more study, it may become clear that tobacco smoking or the air pollution it produces are directly responsible for the development and progression of chronic diseases. In order to help people better understand the relationship between tobacco use and chronic diseases and to identify and treat them at an early stage, this paper describes the effects of tobacco use and air pollution on various chronic diseases and their correlation with emotions. It also describes the corresponding interventions and preventive measures in accordance with the principle of the health impact pyramid.

Keywords: Tobacco; chronic diseases; strategies; health impact pyramid.

1. Introduction

Chronic diseases, such as chronic obstructive pulmonary disease (COPD), chronic bronchitis, cardiovascular diseases (such as coronary heart disease, myocardial infarction), and metabolic diseases have received increased attention as the population continues to age. These conditions have a serious impact on patients' physical and mental health and may even result in emotional disorders. In addition, these illnesses are spreading to younger and younger people, posing a severe threat to public health. The Global Burden of Disease Survey's findings indicate that COPD has moved up to the third place among chronic respiratory diseases as the third biggest cause of mortality in China, where it is estimated that there are close to 100 million COPD patients [1]. However, only less than 10% of people are aware of this disease, the prevalence of COPD in adults over 40 years old is as high as 13.6%, the global prevalence of chronic bronchitis is 6.4%, and the prevalence of cardiovascular disease is about 10% [2-4].

The genesis and processes of chronic diseases are still poorly understood, and a range of variables may contribute to their development. The link between cigarette and chronic diseases is progressively garnering notice as research advances. Sugars, hydroxy acids, organic acids, lipids, pigments, and other chemicals make up tobacco. According to several research, smoking may contribute to the development of chronic diseases by increasing air pollution or a number of other linked factors. However, the precise relationship between smoking and chronic diseases is unclear. In order to provide a theoretical foundation for the diagnosis and management of chronic diseases, this study aims to clarify the relationships between tobacco, air pollution, and other chronic diseases while taking into account recent studies.

2. Explain in detail the relationship between the chronic diseases of tobacco and air pollution

2.1. Chronic Obstructive Pulmonary Disease

COPD is a common, preventable and treatable disease characterized by persistent respiratory symptoms and airflow limitation. The main symptoms include chronic cough, sputum, dyspnea, and

wheezing. Studies have shown that smoking increases the risk of COPD by 2.9-3.5 times compared to non-smokers [5].

2.1.1. Smoking affects lung tissue leading to COPD

To help humans breathe in air, normal lung tissue contains a certain amount of elasticity and is easily expandable. Smoking's long-term effects may gradually deteriorate the lungs' normal structure, altering the elastic composition of the alveolar tissue, reducing the amount of lung tissue that supplies blood with oxygen, depleting the tissue's supply of oxygen, impairing gas exchange, and disrupting ventilation, all of which can result in respiratory distress [6]. Another way that smoke's harmful particles harm the airway mucosa is by causing epithelial cell hyperplasia, an inflammatory response that results in the accumulation of neutrophils, the release of elastase and other biologically active substances by neutrophils, and the destruction of the lung parenchyma, which causes symptoms like coughing up phlegm and congestion [7].

2.1.2. Smoking affects air quality leading to COPD

Excellent air quality can promote blood circulation in the lungs, enhance metabolism, promote the production of immune cells, and strengthen lung capacity. Natural lung flora not only affects the mucosal barrier of the respiratory tract but also removes invading pathogenic microorganisms, and is also associated with changes in intrinsic and adaptive immune function [8,9]. Smoking substantially increases the PM2.5 content in the air, imbalances the normal composition of the lung flora, and decreases the expression of the antimicrobial peptide cathelicidin, which decreases the immunity of the organism and increases the chances of respiratory infections, leading to an acute exacerbation of COPD [8].

2.2. Chronic bronchitis

Chronic bronchitis is a chronic non-specific inflammation of the mucosa and surrounding tissues of the trachea and bronchi, with cough and sputum as the main symptoms, with an annual onset lasting more than three months and at least two years in a row. The prevalence of chronic bronchitis is 2-8 times higher in smokers than in non-smokers [10].

2.2.1. Smoking damages bronchial mucosa leading to chronic bronchitis

Tobacco contains a lot of nicotine and other harmful chemicals, which can irritate the bronchial mucosa, harm the mucosal barrier, engorge and swell the bronchial mucosa, causing inflammation of the airways, enlarging the mucous glands and increasing the amount of phlegm secreted, leading to the symptom of coughing up phlegm [11]. Smoking is a long-term process, the tracheal mucosa is repeatedly stimulated, changing the various defense mechanisms in the respiratory tract, thereby increasing the risk of infection, partly attributable to the impaired function of mucosal cilia and macrophage phagocytosis, which leads to the occurrence of chronic bronchitis [12].

2.2.2. Hazardous elements from smoking trigger chronic bronchitis

When smoking indoors, hazardous elements such as nicotine are produced, which collect in sealed rooms and degrade indoor air quality. Some studies have shown that the level of PM10 in ambient particles is positively related to the incidence of chronic bronchitis, but also with some studies did not find such an association, this aspect needs to be continued to be explored in subsequent studies [12].

2.3. Cardiovascular disease

Cardiovascular diseases include myocardial infarction, coronary heart disease and heart failure. Myocardial infarction refers to a life threatening condition in which the coronary arteries become acutely blocked and the heart muscle becomes necrotic due to a lack of blood supply, impairing the function of the heart. According to statistics, cardiovascular diseases caused by smoking account for about 10% of all cardiovascular diseases [13].

2.3.1. Smoking damages endothelial cells leading to cardiovascular disease

Endothelial cells generate vasodilatory substances, including nitric oxide (NO) and prostacyclin. Prostacyclin is mainly used to enlarge small blood vessels, inhibit platelet aggregation, and fight against thrombosis. Reactive oxygen species in cigarette smoke lead to endothelial cell damage, and prostacyclin release is reduced, leading to platelet aggregation in the arterial wall, obstruction of blood vessels, and myocardial infarction [14]. In addition, smoking increases the peripheral blood leukocyte count and an inflammatory response occurs, leading to leukocyte recruitment, which in turn occludes blood vessels and myocardial infarction occurs [15].

2.3.2. Nicotine from smoking causes cardiovascular disease

Additionally, passive smoking contributes to atherosclerosis, and studies have shown that being around secondhand smoke increases cardiovascular disease morbidity and mortality [16]. Tobacco's nicotine directly impacts the heart and coronary arteries, causing myocardial damage, myocardial infarction, and arterial spasm.

2.4. Metabolic disease

Metabolic diseases are diseases caused by disorders in one of the intermediate metabolic processes. Long-term smoking can lead to metabolic syndromes such as obesity, hyperlipidemia, and fatty liver. Smoking leads to increased heart rate, autonomic dysfunction, accelerated hormone circulation, insulin resistance, decreased insulin sensitivity, obesity, and even the development of type 2 diabetes mellitus [17]. In addition, smoking increases triglyceride levels and decreases high-density lipoprotein (HDL) cholesterol by increasing sympathetic nerve activity, resulting in hyperlipidemia, which also increases the risk of cardiovascular disease [18]. Smoking also leads to elevated fasting plasma cortisol concentrations, resulting in increased visceral adipose tissue and the development of fatty liver [18].

2.5. Mood disorder

Mood disorders are a group of disorders characterized by clinical manifestations such as depression, schizophrenia.

2.5.1. Nicotine from smoking causes mood disorders

Neurotransmitters include dopamine, serotonin, aminobutyric acid, and norepinephrine control mood. Depression risk is increased by smoking. The addictive component of tobacco is commonly acknowledged to be the psychoactive compounds found in cigarettes, such as nicotine. Smokers are more likely to develop depression because nicotine enhances the release of dopamine and other neurotransmitters by binding to nicotinic receptors in the brain [19]. This results in an instantaneous sensation of pleasure that rapidly passes. In addition, nicotine exposure disrupts the hypothalamic-pituitary-adrenal (HPA) axis, resulting in an excess of the stress hormone cortisol [20]. The adrenal glands secrete a hormone called cortisol, whose overproduction can make people feel down and depressed. Cortisol also regulates the body's metabolism, and its overproduction causes centripetal obesity, which in turn causes the patient to lose confidence in themselves and exhibit depressive symptoms. Some smokers make an effort to stop, but find that it is challenging and that they experience emotional issues due of their dependence on tobacco.

2.5.2. Secondhand smoke production leads to mood disorders in pregnant women

Smoking-related air pollution has an impact on mood problems in pregnant women. According to studies, early pregnancy sadness is more likely when passive smoking occurs 1 session each week, each lasting at least 15 minutes [21].

2.5.3 Smoking leads to lung, cardiovascular, and metabolic diseases, which in turn lead to mood disorders

Chronic diseases cause a huge burden on the patient's body and mind, long-term illness makes the patient's attention all focused on the disease, the disease is not cured for a long time exhausted patient's patience, and gradually lose all kinds of interest, fear of bringing burden to the family, resulting in self-blame anxiety anorexia of the world's thoughts, leading to the incidence of depression.

3. Interventions and coping strategies

In order to improve the health of more people, the public health field plays a different role in each of the five levels of the health impact pyramid, and in general, interventions at the bottom tend to improve the health of more people at a lower cost [22].

3.1. Counseling and education

Public health counseling and education interventions for chronic diseases include informing people about how chronic diseases develop, the dangers of further deterioration, and how to manage the disease as early as possible.

3.1.1. Counseling and education for smokers

Family physicians should urge smokers to quit early and inform them that smoking is an important environmental pathogenetic factor leading to chronic obstructive pulmonary disease, chronic bronchitis and cardiovascular disease, and that failure to intervene in smoking can lead to further development of pulmonary heart disease, resulting in respiratory distress, coronary insufficiency and accelerated death. For people who smoke at home, timely testing of the air index, regularly clean the air to avoid air pollution at home.

3.1.2. Counseling and education for people with chronic diseases

For patients who are already suffering from chronic diseases, educate them to adopt a good routine and cultivate healthy habits, such as quitting smoking and drinking, avoiding exposure to second-hand smoke, and practicing good exercise habits to improve their immunity. Regularly measure blood pressure and respiratory rate, and inform the patient of the normal range, once the fluctuation range is too large or symptoms of coughing and phlegm shortness of breath should be immediately hospitalized.

3.2. Clinical interventions

3.2.1. Clinical interventions for people who smoke

For the smoking population, who want to relieve smoking addiction as soon as possible can use nicotine replacement method, such as trying over-the-counter nicotine patch, chewing gum to avoid contact with cigarettes, in addition to trying Chinese medicine to quit smoking, the first is to smell the medicine, that is, the betel nut in the middle of a small hole drilled into the drop of tobacco pouch oil to seal the good, immersed in amoy water for a week, washed and dried. When you want to smoke, smell the betel nut a few times, you will feel the taste of bitter odor, do not want to smoke. The second is chewing medicated candies, made of patchouli, fritillaria, mint and other herbs. This kind of medicated candies can not only assist in quitting smoking, but also refresh the mind and relieve the symptoms of dry mouth. Psychological treatment can also be provided to encourage the patient to have a strong will to quit smoking and to reduce the desire to smoke through distraction methods such as exercise and talking to friends.

3.2.2. Clinical interventions for people with chronic diseases

When compared to the traditional method of swallowing pills, which results in a decrease in drug efficacy, inhalation drug delivery can further avoid the absorption of pills through the gastrointestinal tract and thus achieve a better therapeutic effect. Trained clinical pharmacists educated COPD

patients on the use of medication and guided them to inhalation drug delivery. The recurrence rate was compared between patients receiving medication via inhalation and those receiving it orally, and it was found to be reduced by about 18%. It can be concluded that timely clinical interventions can effectively lower the incidence of COPD. Follow-up visits were conducted after 6 and 12 months to observe whether the patients' medication operation was standardized and whether their adherence was good [23].

3.3. Long-lasting protective interventions

3.3.1. Long-term interventions for people who smoke

For long-term interventions, smoking cessation programs can be conducted to intervene with smokers using a tapering approach. Patients are allowed to prepare a sufficient number of cigarettes before the program begins; if they normally smoke 10 cigarettes per day, they are prepared to smoke seven packs of eight cigarettes per pack for the first week. The amount of cigarettes for the second week was six packs of six cigarettes each. For the third week, the amount of cigarettes will be four packs of four cigarettes each, gradually decreasing. Until complete cessation of smoking. The patients were followed for one to two months, constantly monitored and observed to see if they would continue to smoke if they were not followed, and it was found that the long-term clinical intervention was effective in helping the patients to quit smoking.

3.3.2. Long-term interventions for people with chronic diseases

A community-based team including internal medicine nurses, paramedics, and physicians follows patients with chronic diseases who have been discharged from the hospital. First, we collect information about the patient's personal history, previous history, and history of present illness and evaluate the patient's current status in relation to the patient's health status after discharge from the hospital, and develop a one-on-one continuity of care program. This includes medication plans, exercise schedules, smoking cessation programs, dietary recommendations, psychological counseling, and home oxygen therapy programs. The patients' health status was reassessed every month to compare the improvement, and it was found that long-term clinical interventions were effective in improving the standard of living of patients with chronic diseases.

3.4. Changing the context to make individuals' default decisions healthy

At present, some of the policies of the country as well as society have been gradually improved, such as the banning of smoking in public places and the setting up of some restaurants as smoke-free restaurants. If a smoker enters a restaurant and lights up a cigarette, but the rest of the customers are not smoking, everyone will look at him in a strange way, and he will put out his cigarette due to embarrassment, thus reducing the amount of cigarettes he smokes. As well as government organizations, hospitals, schools, and other office areas are all smoke-free, smokers can gradually change their smoking habits by changing their environment and adapting themselves to a smoke-free place.

3.5. Socioeconomic factors

Increased tobacco taxes have helped the nation's finances and close the wealth-poverty gap while also encouraging smokers to give up their habit. Taking smokers with low economic level as an example, if they only have 50 dollars, they have to balance their life and fulfill their addiction, if a carton of cigarettes costs 40 dollars, they will undoubtedly decide to quit smoking in order to survive. Socioeconomic factors have the most significant effect of change on individuals.

4. Conclusion

When combined with the most recent research, it is shown that air pollution and cigarette smoking are two of the main factors contributing to a number of chronic diseases. Smoking causes damage to

endothelial cells, the bronchial mucosa, the lung tissues, and the air quality, all of which contribute to the development of chronic diseases. The negative effects of smoking should be extensively publicized by many agencies, yet most smokers today still lack health awareness, especially young smokers. The current therapies or preventive measures are more challenging to put into practice, and it is challenging for individuals to stick to them even after they stop smoking. The constraint of not being able to control the amount of inhalation is a barrier for some elderly patients who are unable to get over their dread of inhalation administration. To effectively manage the emergence of chronic diseases in the future, it will be important to further enhance the individual, societal, and national perspectives. In order to lower the prevalence of chronic diseases, it will be important to boost public awareness going forward, improve personal hygiene, and get rid of air pollution.

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