v. 4, n. 102, 2024

International Journal of Health Science

Acceptance date: 02/12/2024

TOBACCO FARMERS AND GREEN LEAF DISEASE

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Abstract: Objective: to expose the health problems caused to tobacco farmers by green leaf disease. Method: qualitative systematic review. The descriptors for selection were "disease" and "leaf" and "green" and "tobacco", or "green" and "tobacco" and "sickness", abstracted from primary studies that sampled tobacco farmers. Results: seven studies were selected and made up the review. Conclusion: Tobacco farmers should wear personal protective equipment in order to avoid green leaf disease.
Keywords: green leaf disease; health; farmer's tobacco

INTRODUCTION

Smoking is a chronic disease classified as a mental and behavioral disorder caused by the use of tobacco[1]. Users who smoke and those who live with or share the same environment as smokers start to suffer from diseases due to the prolonged use of tobacco. The numbers of people affected by smoking and its contribution to morbidity and mortality are alarming and deserve attention. Worldwide, we have a population of 1.1 billion smokers, of whom around 8 million die each year as a result of smoking. It is worth noting that not only the population of smokers suffer from tobacco addiction, but also passive smokers, who number 1.2 million[2]. Active and non-active smokers are defined in the literature as those who have smoked more than 100 cigarettes in their lifetime and continue to use tobacco[3]. Passive smokers inhale and absorb the toxic substances released by tobacco smoke, which are absorbed by the smoker, tripling the harmful effect of the substances on the body. Nicotine and carbon monoxide are among the substances that affect passive smokers, who unlike active smokers, when compared to passive smokers, absorb 50 times more of the toxic substances that cause damage such as cancer of the respiratory system, digestive system, organs such as the pancreas, liver, bladder, uterus, ureter, kidneys and other organs or systems that are affected by the toxic substances that are impregnated in the bodies of active or passive smokers. And other diseases such as allergic reactions and acute myocardial infarction, which are on the increase among young adults. Brazil, a country undergoing scientific, economic and social development, had one hundred and sixty-one thousand deaths in the year two thousand and twenty, with more than four hundred thousand new cases of heart disease and chronic obstructive pulmonary disease, all of which have smoking as a predisposing factor. There were also around fifty thousand cases of strokes and more than sixty thousand diagnoses of cancer, both deaths and diseases for which smoking was one of the risk factors. It can be seen that the huge cost of financial resources for actions to prevent diseases and treat the harmful effects on smokers could be better invested in actions to promote health, which would provide more years of healthy life and be less expensive for the state. Data obtained from the National Cancer Institute on the costs of smoking showed that fifty billion reais were medical costs, with 7.8% of the total going to health care[5]. And other amounts were also costly for society, generating around 75 billion reais spent by family members and others related to disabilities and premature deaths related to the disease, reaching a total of 125.148 billion reais in two thousand and twenty. In terms of tax revenue from the tobacco industry, 12.227 billion reais were returned to the public coffers, equivalent to 10% of total spending[5]. If we consider the expenses that smoking generates, even though the tax revenue from the tobacco industry does not cover the damage caused by smoking.

In view of the above, the aim is to expose the health problems caused to tobacco farmers by green leaf disease.

METHODOLOGY

A qualitative systematic review was carried out by searching for studies. The studies were selected by reading the title and abstract independently. The search databases were the Coordination for the Improvement of Higher Education Personnel (CAPES), Scientific Electronic Library Online (SCIELO), Scientific Electronic Library Online, United States National Library of Medicine (PubMed) and the Virtual Health Library (VHL). The descriptors used for selection were "disease" and "leaf" and "green" and "tobacco", or "green" and "tobacco" and "sickness".

Studies were included in which the research participants were Brazilian tobacco farmers, regardless of gender, with health problems caused by green leaf disease. In Portuguese, Spanish and English, published between 2017 and 2023. The studies were chosen based on their titles and then those with at least one of the descriptors chosen for the study were read, and if the abstract was in line with the research, they were selected for later reading of the full article. Articles were included in which the research participants were tobacco farmers, regardless of gender, from the Brazilian population, and presented the health problems caused by green leaf disease. In Portuguese, Spanish and English, published between 2017 and 2023. It was read by three independent reviewers. There was no disagreement between the researchers as to the relevance of the articles. As the study used data collected from primary studies, it did not need to be assessed by a Research Ethics Committee. The analysis tool was the Preferred Reporting Items for Systematic reviews and Meta-Analyses flowchart[6]. The articles were organized in a table with the variables year of publication, type of study, objective and results.

RESULTS AND DISCUSSION

A case-control study with one hundred and eleven participants showed that bundling tobacco and wearing socks are associated with illness among tobacco workers, while other activities such as stubbing their toes, cutting, carrying and harvesting more tobacco plants protect and reduce the chances of getting green leaf disease[7]. After harvesting, the tobacco is bundled up to be washed and dried in the greenhouses. For this process, the leaves are woven into sticks by hand. When moist, tobacco leaves release nicotine which can be absorbed by the skin. A study suggests that physical contact with tobacco is the main cause of the disease.[8]

The humidity and the use of socks, with the worker having contact with the wet ground and perspiration due to manual labor. The bundling of tobacco for handling with the wet leaves for drying allows direct contact with the dermis, which allows nicotine to be absorbed into the body of the tobacco farmer[7]. Access by tobacco workers to the correct use of Personal Protective Equipment (PPE) and guidance on predisposing factors to green leaf disease could possibly prevent its development. Another study also identified the correct use of Personal Protective Equipment (PPE) as prevention of the disease. The prevalence of the disease was in women. Tobacco workers did not use protective equipment and women were the ones who removed the stalks[9]. Research has shown that tying up the tobacco without wearing suitable gloves, the act of transporting the bales, exposes the tobacco grower to green leaf disease[10].

Agricultural workers are exposed to various types of illness, even if they don't work in the tobacco industry. Excessive sun, extreme cold and not taking care to use protective equipment make them ill even at a productive and reproductive age. It's important for the health sector to take action with people in rural

International Journal of Health Science ISSN 2764-0159 DOI https://doi.org/10.22533/at.ed.15941022402127

Authors	Type of study	Objective	Results
Alves *et al.* (2020)	Case-control	Investigate the relationship between green leaf disease and symptoms with changes in deoxyribonucleic acid and the redox system.	The damage caused to tobacco growers, even in asymptomatic cases, is greater than in controls, and varies according to the symptom presented.
Campos *et al.* (2020)	Cross-sectional study	To assess the occurrence and associated factors of green leaf disease in farmers.	Prevalence 60.7% for men and 39.3% for women. The most frequent symptom was headache. The associated factors were sun exposure, regular health status and pesticide use.
Cargnin *et al.* (2019)	Case-control	To determine the presence of socio-environmental risk factors for the development of green leaf disease in tobacco farmers.	Factors associated with the development of the disease: wearing socks and bandaging tobacco. Factors that reduce the disease: poking tobacco stalks, cutting tobacco stalks, collecting more tobacco stalks and carrying tobacco to the shed.
Pappen *et al.* (2022)	A descriptive, cross-sectional study.	Characterize the sociodemographic and occupational profile and health habits of tobacco farmers with DFVT	Most of the female owners work long hours a day. All had experienced some symptoms of green leaf disease before or after work.
Silva *et al.* (2018)	Cross-sectional study	To investigate the occurrence of green leaf disease among tobacco growers in northeastern Brazil.	Removing the leaf stalks was the exclusive activity of women. Smoking status, years of work, age and years of study did not differ significantly between workers with and without the disease.
Stormovski; Basso; Campos (2018)	Cross-sectional descriptive study;	Evaluate the health effects of DFVT	Most of the workers had symptoms of dizziness, vomiting and headaches, as well as significant changes in respiratory function.

Chart 2 - Studies selected for the systematic review

Source: Author, 2024.

communities. And when it comes to tobacco workers, this is all the more necessary because tobacco exposes them to diseases beyond the green leaf. The direct contact that tobacco farmers have with tobacco leaves contaminates them, causing them to develop the disease through the dermal absorption of nicotine. The importance of wearing personal protective equipment as the main means of protection against nicotine infection.[8]

It is important to highlight the commitment of social and business organizations that show care for tobacco workers. Some, like the Tobacco Industry Union of the Southern Region of Brazil, invest in information highlighting the importance of using protective equipment. They do, however, promote worker safety [11]

It is believed that the clothing, when used correctly, reduces dermal exposure by 98%. It's important to note that there is a kit of clothing for harvesting, which consists of a blouse, waterproof pants and nitrile gloves. It is also recommended that light, cotton clothing should be worn underneath the clothing.[11]

All tobacco growers must use the correct and complete protective equipment for dealing with tobacco, because green leaf disease is not prevented when the use of protective equipment is incomplete. The study found that incorrect use can lead to physical discomfort when working in tobacco farming.[12]

The use of personal protective equipment is essential to prevent risks related to possible accidents at work. Article 166 of Law 6.514 of 1977 states that companies are obliged to provide their employees with PPE free of charge, which is appropriate to the risks posed by the work in question.[14]

According to the IBGE, in 2019, 58% of smokers living in rural areas in Brazil are men. The 2017 IBGE Agricultural Census also found that 81.3% of farmers were male. Being a numerical majority in rural production and smoking, when smoking participants were excluded from the study, a significant number were also excluded from the data, which could cause changes in the results regarding the sex of those infected with the disease.[15]

In Brazil, 92.1% of women aged ≥ 14 years do household chores and/or care for people. Those who are employed devote an average of 6.8 hours more than men to these tasks. The percentage of men who do housework is 80.8%, and is even lower for those with little schooling (74.4%)[16].

The prevalence of the disease affects men, but the country's data shows that this population is also the most exposed, due to the hours women take off from their jobs to do household chores. On average, 88% of the study population has completed elementary school, which shows us that the percentage of men doing household chores is even lower.[17]

In this research on DFVT, a study was carried out with a sample of 51 tobacco workers aged between 21 and 59. Symptoms included dizziness (33.3%), vomiting (33.3%), headache (23.5%) and weakness (11.8%). The study excluded smokers and workers with a history of chronic lung disease and lung cancer. However, the majority of those interviewed, around 70%, reported that they had never experienced the symptoms described [17]

Nicotine was altered in research participants due to green leaf disease. And the symptoms when it manifested were headache, dizziness, abdominal discomfort and weakness[18]

Tobacco growers affected by green leaf disease experienced the same signs and symptoms. The most common were nausea, vomiting, dizziness and headache. The evidence contributes to the clinical identification of the disease and to a protocol for treating green leaf disease among tobacco farmers.

A study found that individuals affected by green leaf disease had a lower inspiratory and expiratory capacity compared to the minimum levels established in the literature, showing a significant reduction in respiratory function [17]

Breathing in a normal state consumes between 3 and 5% of the body's energy, but during exercise this energy can be up to 50 times greater, even more so when there are complications in the airways, which limits the intensity of the exercises performed[19]

The work process involved in growing tobacco requires physical effort in most of the tasks. With impaired respiratory function, the effort required is greater, compromising the worker's physical health and, in the long term, causing them to take time off work.

The green leaf disease had alterations in the deoxyribonucleic acid (DNA) of the 80 participants. 55% developed the disease with complications of nausea (48%), abdominal cramps (48%) and headache (45%)[22] Data has identified that cancer stems from alterations in the DNA of 2018, in Brazil, there are more than 225,000 deaths due to cancer each year. It is estimated that the financial losses are around R$15 billion, considering only the average income of professionals affected by the disease and the years they could have contributed economically until the end of their careers[21,22] The financial impact caused to the country is evident, added to the damage caused by the loss of these lives in their families and society. Currently, prevention remains the best social and economic alternative, because in this case, where there has been evidence of alterations to DNA that could possibly have caused cancers in general, the simple method of using personal protective equipment can prevent this future damage. Therefore, actions to prevent and monitor the use of equipment, encouraged by the federal and union governments, can be promoted for companies involved in tobacco cultivation.

CONCLUSION

The exposure of tobacco farmers in the process of growing tobacco has put them at risk of developing green leaf disease. The signs and symptoms manifested by the study participants can be avoided through the correct use of personal protective equipment, which is considered the best socio-economic alternative for preventing green leaf disease, since its use prevents exposure to the dermis of wet tobacco leaves, the main cause of the disease.

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