

# CUIDADO É FUNDAMENTAL

UNIVERSIDADE FEDERAL DO ESTADO DO RIO DE JANEIRO • ESCOLA DE ENFERMAGEM ALFREDO PINTO

RESEARCH

DOI: 10.9789/2175-5361.rpcfo.v13.9233

## PERCEPTION OF A RURAL POPULATION ON THE USE OF AGROTOXIC\*

Percepção de uma população rural sobre o uso de agrotóxicos

Percepción de una población rural sobre el uso de agrotóxicos

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### How to quote this article:

Richartz A, Heidemann ITSB, Vicente C, et al. Perception of a rural population on the use of agrotóxicos. Rev Fun Care Online.2021. Jan./Dec.; 13:1179-1185. DOI: <http://dx.doi.org/10.9789/2175-5361.rpcfo.v13.9233>

### ABSTRACT

**Objective:** To identify the knowledge of a rural population about the health implications generated by the abuse of pesticides. **Method:** qualitative, exploratory-descriptive study. The semi-structured interviews took place from July to August 2017, including 12 rural residents from one of the areas covered by the Basic Health Unit of the municipality of Antônio Carlos. Data were submitted by thematic analysis. **Results:** it was revealed that the participants know the concept of pesticides, however, have failed to identify the damage generated to health. Another important factor was the disuse of personal protective equipment, as well as the lack of knowledge about possible health-promoting activities. **Conclusion:** the population has little knowledge of the consequences of using pesticides, using them incorrectly due to need and / or lack of knowledge of alternatives. It is evident the need for health education activities, together with the multidisciplinary team, focused on primary care.

**Descriptors:** Agrochemicals, Rural health, Health promotion, Primary health care, Public health, Nurses.

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## RESUMO

**Objetivo:** Identificar o conhecimento de uma população rural sobre as implicações na saúde geradas pelo uso abusivo de agrotóxicos.

**Método:** estudo qualitativo, exploratório-descritivo. As entrevistas semiestruturadas ocorreram de julho a agosto de 2017, incluindo 12 moradores rurais de uma das áreas de abrangência da Unidade Básica de Saúde do município de Antônio Carlos. Os dados foram submetidos pela análise temática. **Resultados:** revelou-se que os participantes conhecem o conceito de agrotóxicos, contudo, apresentam falha na identificação dos prejuízos gerados à saúde. Outro fator destacado, consistiu-se no desuso dos equipamentos de proteção individual, da mesma forma, que o desconhecimento das possíveis atividades promotoras da saúde.

**Conclusão:** a população possui pouco conhecimento das consequências da utilização dos agrotóxicos, utilizando-os de maneira incorreta por necessidade e/ou pela falta de conhecimento das alternativas. Evidencia-se, a necessidade de atividades de educação a saúde, em conjunto a equipe multiprofissional, voltadas a atenção primária.

**Descritores:** Agroquímicos, Saúde da população rural, Promoção da saúde, Atenção primária à saúde, Saúde pública, Enfermagem.

## RESUMEN

**Objetivo:** Identificar el conocimiento de una población rural sobre las implicaciones para la salud generadas por el abuso de pesticidas.

**Método:** estudio cualitativo, exploratorio-descriptivo. Las entrevistas semiestruturadas tuvieron lugar de julio a agosto de 2017, incluidos 12 residentes rurales de una de las áreas cubiertas por la Unidad Básica de Salud del municipio de Antônio Carlos. Los datos fueron presentados por análisis temático. **Resultados:** se reveló que los participantes conocen el concepto de pesticidas, sin embargo, no han podido identificar el daño generado a la salud. Otro factor importante fue el desuso del equipo de protección personal, así como la falta de conocimiento sobre posibles actividades de promoción de la salud. **Conclusión:** la población tiene poco conocimiento de las consecuencias del uso de pesticidas, usándolos incorrectamente debido a la necesidad y / o falta de conocimiento de alternativas. Es evidente la necesidad de actividades de educación para la salud, junto con el equipo multidisciplinario, centrado en la atención primaria.

**Descritores:** Agroquímicos, Salud rural, Promoción de la salud, Atención primaria de salud, Salud pública, Enfermeros.

## INTRODUCTION

Pesticides are considered products and agents of physical, chemical and / or biological processes, widely used by the production, storage and processing sectors of agricultural products.<sup>1</sup> In legal terms, the term and concept of pesticides was defined by the Agrochemicals Law N. 7,802 / 1989,1 being regulated by Decree No. 4,474 / 2002.<sup>2</sup>

The use of pesticides in agriculture began in 1950 in the United States of America. In Brazil, it spread shortly thereafter, in 1960, with the National Program for Agricultural Pesticides starting in 1970, with the purpose of increasing and improving crop productivity.<sup>3</sup> Between 2000 and 2010, the growth rate of Brazilian pesticide market was

190%, against 93% of the world market.<sup>4</sup> In 2007-2014, there was an increase in the amount of pesticides traded in Brazil, from 63,353,689 kilos to 1,552,998,056 kilos, an equivalent increase. at 149.14%. The year 2014 was considered the largest record of pesticides traded in the country.<sup>5</sup>

Regarding consumption, Brazil has also been considered the largest consumer of pesticides since 2008, accounting for 86% of Latin American consumption. In 2012, Santa Catarina stands out as the 11th largest consumer in Brazil.<sup>4</sup> In 2018, the southern region remained with the highest percentage of pesticide-using establishments, with Santa Catarina accounting for 72.1% of the establishments.<sup>6</sup>

There is also an increase in the number of notifications due to poisoning, with an increase of 139% of notifications, with 2014 being the year with the highest number of notifications (12,695 cases). The state of Santa Catarina ranks 6th among the states with the most notifications between 2007 and 2015, with progressive increase in cases.<sup>5</sup>

The use of pesticides constitutes an important public health problem<sup>7</sup>, taking into account the increased epidemiological data mentioned above and especially the health problems that can be either acute or chronic intoxication. Strict criteria regarding the use of these substances and the encouragement of the use of Personal Protective Equipment (PPE) are essential for the prevention of these diseases.<sup>8</sup>

It is noteworthy that the agricultural production in Brazil depends on the use of these substances for large scale production, thinking about the profitable purpose. There are approximately 4.4 million farming families, accounting for more than 50% of food production in the Brazilian staple basket.<sup>9</sup> Thus, the main responsible for the economy linked to the Brazilian domestic market, as their main source of income, becoming, in most cases, an obstacle to the control of the use of these substances.

In view of the large population exposed both in and around agrochemical plants, in agriculture, in the vicinity of agricultural areas and by consumers of contaminated foods themselves<sup>7</sup>, considering the importance of this theme due to the significant increase in epidemiological data, as well as the significant percentage of the state of Santa Catarina in this context and the relationship with family farming. The research question is: What is the knowledge of a rural population about the health implications generated by the abuse of pesticides? And the objective: to identify the knowledge of a rural population about the health implications generated by the abuse of pesticides.

## METHODS

It is a qualitative research of exploratory and descriptive character. Against the backdrop of the city of Antonio Carlos, a rural city located in Santa Catarina / Brazil. The municipality of Antônio Carlos has a population of 8,327 inhabitants, of

which 4,375 rural residents. The city has 2,468 families, of which 1,348 have its main source of income in agriculture, with the production of fruit and vegetables.

According to the Basic Health Unit (UBS), this population is divided into areas according to the coverage area, and the coverage area for the study was selected through a draw made jointly with the research team.

The collection took place from July to August / 2017, during this period visits were made in the selected coverage area of the UBS, in order to present and explain the research proposal, inviting the population for inclusion in the study. Residents who showed interest had their collection individually scheduled at the participant's own home, with a previously agreed time and date, in order to facilitate interaction between researcher and participant, providing a private, quiet and pleasant environment for both. Residents under 18 years of age and / or not legally answerable for themselves were excluded.

A sample of 12 participants was obtained, and this number was determined by the data saturation criterion. Data collection occurred through semi-structured interviews, with audio-recorded responses and later transcribed in full. A two-part collection instrument was organized, containing questions on the sociodemographic profile and guiding questions on the perception of pesticide use and its health implications.

The data were organized in tables in the Microsoft Word® program for data analysis based on thematic analysis.<sup>10</sup> In this proposal, the material was briefly read with the pre-analysis stage and the data were explored being grouped into thematic units, categorized and discussed in the light of Health Promotion and Primary Health Care.

This study was approved by the Health Research Project Monitoring Committee of the Antônio Carlos Municipal Health Secretariat and the Federal University of Santa Catarina Ethics Committee (CEP / UFSC), opinion no. 2,177,210 and CAAE no. 67110117.0.0000.0121, approval date: 07/18/2017. In order to maintain confidentiality, the participants were called codenames based on planet names, they were clarified about the importance of the study and agreed with the research by signing the Informed Consent Form.

## RESULTS

Of the 12 participants, five were male and seven female. The age range ranged from 24 to 77 years, most of them over 50 years old and with incomplete elementary schooling. All had family farming as a profession, with some already retired.

The analyzed data resulted in four categories: "Understanding and use of pesticides"; "Benefits and harms of pesticides"; "Use of PPE" and "Attitudes and actions for health promotion".

## Understanding and using pesticides

Regarding the understanding of the meaning of pesticides, participants related it to poison, often using these words as synonyms. Only one participant referred to it as medicine. These were cited as products used in the crop as pesticides, fighting pests and weeds.

*In the head comes poison, but they are products that we use for farming, they are pesticides. (Pluto)*

*These are medicines, the pesticides we use in the fields. (Neptune)*

Of the participants, all use or have already used pesticides, being the exposure directly through the application of the product on the plantation or indirectly, working in the field after its use. Most report that they use pesticides in the smallest amount possible, appearing different justifications for this regulated use, from harm to the population to the high cost of substances. In this context, only one person refers to using restraint due to concern for the environment claiming it brings harm to the land resulting in low productivity.

*We only go when there is need, not directly, the less we can use the better, because it is lower cost, because this is all expensive and today the greenery is already cheap. (Jupiter)*

*Now the people use it a lot as weeding, to clear the land, it spoils the land, spoils everything, in the end, no more planting. (Venus)*

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*Now the people use it a lot as weeding, to clear the land, it spoils the land, spoils everything, in the end, no more planting. (Venus)*

It is evident that the use of pesticides is a common practice that occurs consciously, since they relate the pesticide as a synonym of poison, bringing harm to the

environment and the health of the population, although most of the time this concern be focused on agricultural productivity and profitability.

### Harm and benefits of pesticides

The use of pesticides has both positive and negative aspects for both population health and agriculture, depending on how they are used. Everyone believes that pesticides do not bring health benefits to the population. However, they use them to facilitate the work process, replacing weeding and protecting the crop from pests, since the damage caused by them generate an obstacle that hinders sales.

*It has no health benefit, I think it will only shorten life. (Venus)*

*For the crop he brings benefit, will plant cucumber, pepper, eggplant, everything, row everything. If you do not use pesticide you do not reap anything. (Saturn)*

Quando se trata da saúde, a maioria dos entrevistados afirma que os agrotóxicos oferecem riscos para a saúde, sendo o principal, o desenvolvimento de câncer, como também, problemas na pele, desconhecendo outros danos à saúde.

A maioria relatou já ter se intoxicado ou conhecem alguém que se intoxicou com o uso dos mesmos. O histórico de falta de ar, tontura, dor de cabeça, náusea e vômito são os principais sintomas apresentados após a exposição aos agrotóxicos. Sendo que apenas duas pessoas relataram que procuram um estabelecimento de saúde quando estes eventos ocorrem.

*I know it's bad for your health, but it's survival. What we hear most is that the pesticide is the major culprit of so much cancer. (Mars)*

*I got sick already. I felt short of breath, got very bad, sick and vomiting. I thought I was going to die. I went to the clinic and had a lot of serum. (Neptune)*

In this scenario, only one participant reported using all commercially available PPE to protect their health, as they are aware that not using them can have irreversible consequences for their health. Thus, it is evident the misinformation and lack of awareness about safety in work, exposing and bringing harm to health.

### Attitudes towards health promotion

This category shows knowledge about the concept of health and what attitudes they adopt to promote it. Although the word health has a broad meaning, for all study participants, it refers to something in common, relating directly to the absence of disease. Everyone considers that

a healthy person is one who has no pain, who does not use medicines and is willing to work. They state that having health is essential, because without it the work process becomes difficult.

In this context, about attitudes that can be taken to promote health, only two participants reported the use of PPE in agriculture, some mentioned eating healthy foods and exercising, as well as the use of pesticides consciously and proper.

*The use of pesticides in small quantities and respecting the grace period needed to harvest crops. (Jupiter)*

The other study participants pointed out that they do not know the meaning of health promotion. One of the participants perceives a deficit regarding the teaching of the population about health care and the use of pesticides.

*We are not even aware of our health care, actually never tried to try to know, I think it was good to have more explanations, because who sells only wants to sell. (Mars)*

Even though incipiently, participants relate health promotion to healthy daily living habits, highlighting that there is still much to promote the health of the population.

## DISCUSSION

In 2017, there was a predominance of male agricultural producers (81.4%), especially in the 45-65 age group (48.78%), with the majority having completed or incomplete primary education (79, 1%)<sup>6</sup>. This profile meets the participants included in the present study, as well as in studies that show the predominance of males in the application and preparation of pesticides<sup>11-12</sup>, while females act by dedicating themselves to manual weeding and care of vegetables.<sup>13</sup>

The pesticide can be called pesticides, pesticides or pesticides, however, according to Law N.7.802/1989, the defined term was pesticide.<sup>1</sup> This occurred, possibly because this term translates the potential risks of the product and warns workers and the population as these substances can bring benefits to agricultural productivity as well as damages to the health of exposed people, being considered a "medicine" and/or "poison" by the participants of this study.

These data make clear the participants' superficial knowledge about the concept of pesticides and the consequences of misuse. It is considered that this finding may be related to the level of education and technical training of the research target audience. It is noteworthy that the participants' education meets the priority audience of agricultural producers highlighted in the 2017 census.<sup>6</sup> Some authors point out that farmers with limited access to information or low education, perform the inappropriate

management of pesticides, because they do not know the dimension of their unhealthiness, being exposed to greater risks and damages to health.<sup>4</sup>

A recent study conducted in southern Brazil brings precisely the low level of education as a public health problem<sup>13</sup>, this is mainly due to the difficulty of understanding, interpreting and reading the instructions on the use and storage of pesticides, as well as PPE.

This problem can intensify when these workers are from family farming, because it is associated with low technical orientation and equipment with less technology.<sup>14-15</sup> Becoming a difficulty, because in view of the absence of technologies, they become fundamental for production as the pesticide assists in improving productivity and profitability, enabling economic competitiveness in the market and sales.<sup>16</sup>

On the other hand, it should be noted that the agribusiness and industrial productive structure of the country also influence the permanence of this reality in the national context.<sup>17</sup> It is highlighted in a European study that the global market continues at a fast pace, charging the high production index with multinationals reaping the benefits of farm workers who are increasingly exposed to serious damage to health and environmental degradation.<sup>18</sup>

Among the damage brought about by the misuse of the pesticide commented above are acute or chronic poisonings. The study shows that the population recognizes the main signs and symptoms of acute intoxication, which may be the result of accidental, occupational, environmental or intentional exposure due to suicide attempts<sup>19</sup>, noting that the latter cause was not identified by the study participants.

In this context, most were never diagnosed with pesticide poisoning, although they had already experienced at least one of the symptoms related to acute intoxication<sup>12</sup>, contrary to the present study, showing that the participants already had the symptoms, but did not seek medical attention may not obtain the correct diagnosis and treatment.

Most of the population is unaware of the damage caused by chronic exposure, which is evidenced by an integrative review<sup>3</sup>, bringing a finding of 116 studies that demonstrated the negative impact on human and environmental health of the use of pesticides, being needed transparency relative to chronic exposure through work or food.

Most participants lists as a result of chronic use of pesticides, the development of cancer is considered a chronic intoxication grievance derived from long-term exposure. On the other hand, there are other changes generated by this exposure that are not recognized by the population.<sup>18</sup>

Psychiatric disorders are not mentioned by the study participants, possibly related to the lack of knowledge of the relationship between pesticides and these changes. National and international studies show that in predominantly rural areas with a history of pesticide use, rates of depression

and anxiety are highly prevalent, higher than the national average, and one of the predisposing factors for suicide.<sup>20-21</sup>

All these problems generate costs for public health and damage to the national economy. Many cases of poisoning could be prevented by the use of adequate protection, thus, farmers need to be made aware of the health and environment, showing the importance of the correct use of PPE<sup>13</sup>, as this equipment makes the individual less susceptible. threats to worker health.<sup>8</sup>

In this context, it is necessary to implement strategies to promote workers' health and public policies that encourage the reduction of pesticide use and the correct management of PPE.<sup>22</sup> International study raises concern regarding actions aimed at raising awareness among farmers the health implications of pesticide use, suggesting education projects such as interactive radio discussions, field training sessions and incorporating the theme into the educational curriculum.<sup>23</sup>

Health promotion activities play a fundamental role in this context, aiming at their performance in social, economic, educational and environmental transformations, in order to generate effective health actions, seeking to increase the well-being and health of the person and / or community, starting from an integral and socio-environmental view.<sup>22</sup>

Together with the multiprofessional team, nurses play an important role in health promotion activities, as they allow interaction between actions and target population with the health team. The nurse has responsibility for developing actions to promote and protect against diseases, aiming at the implications in the context of public health, and should act to expand theoretical and practical knowledge about the care of rural populations and the use of pesticides, generating improvements in practice and workers' health and the general population.<sup>22,24</sup>

A study conducted in rural communities showed that full use of PPE occurred in more than half of the cases, however, the correct sequence of order to wear and remove PPE was low.<sup>17</sup> This finding adds to the finding already found. that only one participant reported using the PPE, showing a low adherence of the use of this equipment by the population and praising the risks to exposure, as caution should occur at all stages of pesticide use.

## CONCLUSIONS

In this study, we identified the knowledge of a particular rural population about the use of pesticides, reaching the objective of the study.

The use of pesticides is a common practice among participants, however, according to them, the frequency of this use occurs consciously, since pesticides can cause harm to health. However, most do not use PPE, which portrays a dichotomy. Thus, it is highlighted that the population has information about the consequences of pesticide use, however, it is weakened, causing the individual and

collective protection means to be performed incorrectly.

Regarding health promotion, it is evident the importance of carrying out further educational activities in conjunction with a multiprofessional team, since it was identified the lack of knowledge of the local population about the risks of pesticide poisoning, its relationship with diseases and health promotion.

This study represents a small step in the scientific production on health promotion and the importance of prior knowledge on the use of pesticides, making it necessary to carry out new studies in order to cover other realities, improving the existing information.

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Received on: 09/08/2019  
Required Reviews: 16/10/2019  
Approved on: 18/10/2019  
Published on: 14/06/2021

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The authors claim to have no conflict of interest.