



VULNERABILITY OF RURAL WORKERS TO PESTICIDES

Vulnerabilidade dos Trabalhadores Rurais aos Agrotóxicos

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Abstract: Introduction: The excessive or inadequate use of pesticides can directly or indirectly interfere with human and environmental health, representing one of the major public health problems. **Objective:** To know the opinions of the rural workers about the health risks related to the use of pesticides. **Methodology:** This is a descriptive-exploratory research, with a qualitative approach. It was carried out with 13 rural workers in a rural district from a municipality located in the North of Minas Gerais, Brazil. The collected data were typed in Word and later analyzed using the ATLAS.ti 7 software, employing the Thematic Content Analysis. **Results:** The rural workers presented a low schooling level and a superficial knowledge about the health risks involved in the handling of any type of pesticides. **Conclusion:** The results revealed the social vulnerability of these rural workers when daily handling pesticides in their work activities, and the risks related to their health became evident.

Keywords: Rural Workers' Health; Pesticides; Occupational risk.

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Resumo: Introdução: O uso abusivo ou indevido de agrotóxicos pode interferir de forma direta ou indireta às condições de saúde humana e do meio ambiente, constituindo um dos principais problemas de saúde pública. **Objetivo:** Conhecer as percepções dos trabalhadores rurais sobre os riscos relacionados ao uso de agrotóxicos para sua saúde. **Metodologia:** Trata-se de uma pesquisa do tipo descritivo-exploratória, com abordagem qualitativa. Foi realizada com 13 trabalhadores rurais em um distrito rural de um município do Norte de Minas Gerais, Brasil. Os dados foram transcritos no programa *WORD*, posteriormente foram analisados no programa *ATLAS.ti 7* com base no referencial de Análise de Conteúdo Temática. **Resultados:** Os resultados revelam baixo nível de escolaridade dos trabalhadores e que esses possuem conhecimento superficial sobre os riscos à saúde que o manuseio de qualquer tipo de agrotóxicos pode trazer. **Conclusão:** Diante dos achados ficou evidente a vulnerabilidade social desses trabalhadores rurais no dia a dia ao manusear os agrotóxicos, bem como os riscos de danos à integridade da saúde dos mesmos.

Palavras-chave: Saúde do Trabalhador Rural; Agrotóxicos; Risco ocupacional.

INTRODUCTION

The excessive or inadequate use of pesticides in agriculture is directly or indirectly associated to human and environmental health conditions, representing one of the major public health problems⁽¹⁾. According to the World Health Organization (WHO), due to the several effects of single or multiple exposures to pesticides, these chemicals are considered a severe risk for human health. In the developing countries, these exposures represent one of the major causes of world morbidity and mortality. In Brazil, for example, there is a growing use of pesticides in the croplands, with the governmental compliance^(1,2).

In 1990, the WHO has estimated approximately 3,000,000 cases of acute intoxication annually worldwide, more than 700,000 cases chronic adverse reactions, about 75,000 cases of cancer due to the exposure to these compounds, and an estimate of 220,000 deaths⁽³⁾.

According to the National System of Toxicopharmacological (SINITOX), there were 6,103 recorded cases of human intoxication by pesticides in Brazil, in 2004, with 164 deaths. At that time 12,490,726 people lived in the Brazilian agricultural areas⁽⁴⁾.

One of the ways that rural workers can protect themselves from the harmful effects to their health caused by pesticides, is using the Personal Protective Equipment (PPE). When they are not used or only partially used, the workers are exposed to the absorption and intoxication by pesticides through their airways and skin, which might result in acute or chronic intoxication contexts and also in the development of pathological clinical conditions such as cancer⁽⁵⁾.

Therefore, this investigation is important in order to reflect upon the health of the rural worker, as well as about the risks to which they are exposed and the ways of prevention. Further, the lack of scientific literature about this issue has encouraged this investigation, with the aim of addressing the vulnerability and integrity of the rural man facing the exposure to pesticides.

Based on the above considerations, the objective of this study was to know the views of the rural workers about the risks to their health related to the use of pesticides.

METHODOLOGY

This is a descriptive-exploratory investigation, using a qualitative methodology. It was conducted in a rural district from the municipality of Nova Porteirinha, in the northern part of the state of Minas Gerais, Brazil, with an economy mainly based in plant crops from several fruit species, among them banana. The study was performed with rural workers over 18 years old that were in full workforce. The choice criteria was to be between 18 and 60 years old, to be working in agriculture for more than one year, to live in the rural district, to be able to take part and answer questions in an interview, and to accept to participate in this investigation. The workers excluded were younger than 18 years old and older than 60 years old, did not live in the rural area, worked for less than one in year in farmlands, and were not able to participate in the investigation.

The participants of this investigation were randomly selected according to their work areas which were known by an agricultural technician that helped with the first contact with these

workers. After the contact with their working area, the participants were invited to participate in this investigation and were also questioned about their profiles and informed about the objective of this work.

A total of 13 agricultural workers were interviewed, with the data collection being terminated according to the criteria of saturation. Two different data sources were used: the form for socioeconomic data gathering and a semi-structured interview. The form contained closed questions with the aim of gathering information such as: sex, age, origin, schooling level, data related to plant crop, and handling of pesticides. These were collected together before the semi-structured interview, with the aim of constructing the profile of the participants. The script of the semi-structured interview was composed by questions that addressed their understanding about the following issues: risk, routine of their work, the use of pesticides and personal protective equipment during their working activity, working time, and the main crop cultivated in their working place. The interviews were made from March to July, 2017; some being performed in their working places and others in their houses, in a previously scheduled time, all conducted in a private environment and keeping their privacy. Before starting the interview, we have requested prior authorization to record them and later we transcribed them. The interviews had on average 40 minutes, including answering the form.

The data were transcribed to the *Word* software and were later analyzed by the *ATLAS.ti 7* software, using the Thematic Content Analysis methodology.

This investigation was conducted based on the Resolution n° 466 of 2012, from the National Council of Health, after approval from the Ethics and Research Committee, under the Report n°

1.792.197. In order to assure the privacy of the information presented in the results, the reports of the participants were identified with the letter “P” (from person) and a number related to the order of the interviews.

RESULTS AND DISCUSSION

A total of 13 rural workers took part in this study from six different areas, with 92.3 % being males and only 7.7 % females. Among these workers, 46.2 % of them were between 18 and 35 years, and 84.6 % have only the elementary level of schooling. Social vulnerability is related to the structure of the daily life of the individuals. Among the circumstances that might result in social vulnerability in the developing countries, we might list the following: socioeconomic disparities in the population; low schooling level, and specific vulnerabilities related to the female gender and with working issues, among others ⁽⁶⁾.

The major agricultural crop in the working place of the participants was the banana. Regarding the working time of the participants, 23.11 % of them have been working for 20 years or more in agriculture, with 92.3 % of them working about 8 hours a day, and 46.2 % spending from 4 to 6 hours applying pesticides. Among the workers interviewed 30.8% reported they do not apply pesticides in the crops anymore.

In the present study, in order to understand the answers of the respondents to the questions posed by the investigators, based on their perspective and experiences from the rural world, the investigation was centered in some observations and behavior analysis presented along the reports of the farm workers.

They were asked about their knowledge about the diseases they are exposed when handling

pesticides. Being cancer one of the diseases chosen in the script of the investigation, the reports reveal that most of the participants ignore that pesticides are one of the major causes of cancer.

“Well... I don't know about this...” (P1)

“I thought it was caused by the sun, I think it is caused by the sun.” (P2)

“About this I don't know what to say.” (P3)

“No.” (P5)

“No, I don't know.” (P10)

“Well, the sun in first place and secondly smoking, I think that's it.” (P11)

In an ecological study from 2000 to 2010 conducted in some municipalities of the state of Ceará in which farming workers were divided in two groups, the first one being composed of workers that intensively used pesticides and the second group that did not use pesticides in their crops. The first group identified a large number of admissions by neoplasms, while the second one presented a steady and low rate, without statistical relevance⁽⁷⁾. Such results revealed that, indeed, the agricultural workers are more vulnerable to cancer due to the context in which they are inserted, since they handle such products directly and are directly exposed to them. This reinforces the importance of using the protective equipment in order to minimize such risks.

An observational-exploratory study made with agricultural workers exposed to ultraviolet sun radiation and to pesticides, performed in a rural area in the extreme South of Brazil in 2015, concludes that the encouragement to use Personal Protective

Equipment (PPE) is associated to knowledge about the disease, which might affect changes of behavior in the rural workers⁽⁸⁾. When proper information is provided about the risks of pesticide use, the compliance with the use of protective equipment is higher, preventing these situations.

For Cezar-Vaz *et al.* (2015), in many situations where the workers operate in a dangerous situation they neglect this risk. Many workers have the cultural belief that working without the protecting equipment might imply even an act of bravery and maleness, while using protecting equipment is regarded as “fag stuff”⁽⁸⁾.

The rural workers were asked about their knowledge and use of the PPE during their daily life work routine and in the application of pesticides or fertilizers. The answers showed the acknowledgement of the importance of the PPE for their own health and the risks they are exposed to if they do not use this equipment in a correct way, as is present in the following reports:

“It is individual, each person has its own PPE, and later after they finish it is washed before being used again, uses an individual mask, disposable, there is a disposable one and another one that you wear to... that absorbs.” (P1)

“I know that if I don't use them it might harm my health, I don't know how to answer but, it is you have to use it for your own safety.” (P2)

“Gloves, glasses, cap, clothes, boots, we have everything...” (P3)

“We have the clothing, the

overalls, we have the mask, the glasses, the apron, we have the rubber boot.” (P5)

“Yes we use them. There is a PPE that is used when you work in the irrigation. There are gloves, cap, also a mask.” (P8)

These results contradict other studies related to auto-protection during farm work, in which other authors remark the non-use of PPE by the workers. In a study that aimed to analyze the use and handling of pesticides by rural workers in ten communities from the municipality of Vitória de Santo Antão, in the state of Pernambuco, Brazil, the authors observed that the workers were even more vulnerable to harmful exposures to pesticides, since 95 (27.7%) workers reported the application of pesticides without using any PPE and 13 (3.8%) were not aware of protective equipment⁽⁹⁾. Similar results were found in another study in which the agricultural workers were questioned about the use of PPE⁽¹⁰⁾.

Viero *et al.*, (2016) investigated the perceptions of rural workers about the risks resulting from the use of pesticides for your health. During the interviews they realized that the workers were aware about the risks associated with handling pesticides, sometimes being worried about the consequences of this activity. However, they disagreed about the direct association between the use of pesticides and possible health problems, presenting therefore an inadequate use of PPE⁽¹¹⁾.

Another important aspect regarding the practice of the rural worker is the way they dispose the containers that held any type of pesticide to be used in agriculture. We know that the incorrect disposal causes several harms to the health of the workers and of their families, since they live close to their working places. Besides that, this

inadequate disposal might contaminate the rivers, lakes, and springs, killing fishes and other living beings^(9,12). The rural workers interviewed in this study apparently know and perform the correct steps to return the containers, as seen in the following reports.

“We always do it, the triple washing, and it is punctured and delivered in the delivery point, which is the place that we have.” (P1)

“We wash it, they ask us to wash it, so we wash them. And then we keep it and then give it back.” (P6)

“We give it back. We wash it and flush it, leave everything ok for the return.” (P7)

“We wash it and give it back. There is an office in town that receives it, a collection point, isn't it, where you give the bill of sale and they receive it.”(P13)

Although these workers know what to do with the vials after use, this knowledge does not eliminate the need of situational diagnosis of the environmental problems, particularly related to soil and river contamination and specific training. In contrast, in the study made by Siqueira *et al.*, (2012) 67 (19.5%) of the workers reported to ignore the Recycling Law and 50 (14.6%) did not follow the standardization that addresses all the regulations that should be applied to the disposal of pesticide packages⁽⁹⁾.

Besides discarding the packages in a proper way, it is critical to also take care of the PPE. The cleaning and storage of these items are very important and the rural workers have proven to

understand that need.

“No, it is washed individually, each one, let’s suppose, if every person finishes washing it, he washes it in order to use it again because these clothes we use they have, they have a certain amount of washing that might be applied.” (P1)

“Washing, isn’t it? Use the boots, use the clothes, which are the stuff, the mask, cap, gloves, everything ok, the complete PPE.” (P4)

“It is washed every day, every day you use it you wash it, you can’t store it without washing at all.” (P11).

In a study performed by Espindola & Souza (2017), there is a controversy related to the use of PPE since, in some situations, even using the protective equipment there is still a risk of intoxication and contamination and, in certain cases, the situation might even get worse, increasing the risk if the equipment is not used correctly⁽¹³⁾.

Among the consequences of the intensive use of pesticides is intoxication. Peres, Rozemberg & Lucca (2005), in a study made in the region of the Micro Watershed of the São Lourenço Stream, in the municipality of Nova Friburgo, Rio de Janeiro, Brazil, noted that many workers exhibited many defensive strategies when addressing cases of intoxication, always referring to these cases as involving other people and never related to themselves, even stating that some people have a “weaker” immune system to a specific type of pesticide⁽¹⁴⁾. In this study, we have observed a similar situation. When asked if they have already experienced cases of intoxication by pesticides, the

workers denied and referred to third parties:

“I have never had any problem with this stuff, I have always been extremely careful so, even with more than 20 working in this crop, I have never faced this problem.” (P1)

“I know, it causes, many people have thrown up, not from here, but I have heard it, and also in television when you watch Globo Rural, with people explaining that some individuals feel sick, experience diarrhea, experience everything because they do not use the proper equipment.” (P7)

In analyzing such statements we realize that the worker feels the need to defend their working place, claiming that there are cases of intoxication by pesticides, but not in their crops and not involving himself, only third parties. There is a denial or lessening of the risks and the development of defense strategies. Dejours (1992) classifies this process as denial-lessening of the risk as “defensive ideology” in which the worker develops this sort of ignorance of the danger as a strategy to survive dealing with the job since, although being aware of the risks present he develops the idea that he controls the danger, considering that the coexistence with this environment as essential⁽¹⁵⁾. Another question to the workers asked what they would do if they experienced any intoxication after the application of any pesticide:

“You know... you have to look for a medical facility and take the label of the product with you to

discover the cause.” (P5)

“You know, we would look for a doctor. It is the first thing we do.

Taking with us the product that we were using...” (P6)

“What they ask you when you are feeling like that is to wash thoroughly the hands and the face with soap and flowing water, and then look for a doctor.” (P8)

This shows the importance of a sector in the company that should be responsible for training the agricultural workers that deal directly and daily with toxic products. Zaratim *et al.* (2016) highlight the importance of the awareness of all the employees that work in agricultural activities regarding the importance of the use of PPE and about the potential risks of using pesticides without the proper protection. They point out also that the legislation determined by the NR 31.881 (2011) disposes that the work security training should be performed monthly by the companies with a minimum hour load of 20 hours, with a maximum of 8 hours per dia.

CONCLUDING REMARKS

This study allows us to conclude that the workers realize that pesticides are detrimental for their health and acknowledge the importance of wearing the PPE for protecting their health. However, the social vulnerability of these rural workers became evident daily when they handled the pesticides, as well as the risks to their health. The social responsibility with the health of the rural workers requires much more than the responsibility of the State in the elaboration of public policies. It demands the involvement of all institutions in the development of social strategies at the local

and regional level that reduce the inequalities and promote the well-being of the vulnerable people, in this case the agricultural workers.

CONFLICTING INTERESTS

The authors declare the absence of conflicting interests in the present study regarding the funding of this investigation.

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