

KNOWLEDGE OF FARMERS ABOUT RISKS OF INTOXICATION BY THE USE OF AGROCHEMICALS¹

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ABSTRACT

Objective: To explore farmers' knowledge about the risks of intoxication due to the use of agrochemicals. **Methods:** a quantitative research of the exploratory descriptive type was developed, which was carried out in the city of. In a sample of 257 farmers. The data were collected through an objective questionnaire form during the first half of 2017. The analyzes of the results were based on the descriptive statistical analysis. **Results:** farmers are aware of the risks associated with the use of pesticides, and have already shown signs or symptoms associated with intoxication such as nausea, vomiting, dizziness, malaise and headache, but were not diagnosed with intoxication. Farmers make use of personal protective equipment, but not in an adequate way and comply with Law No. 9,974 of June 6, 2000 (6) regarding the destination of the packages. **Final considerations:** research such as this may strengthen the effectiveness of existing public policies to promote the health of rural workers and, at the same time, help in the construction of new proposals that benefit agricultural work and the prevention of aggravations resulting from this work.

Keywords: Pesticides. Rural worker health. Health promotion.

INTRODUCTION

Subsistence agriculture, whose products are responsible for supplying a significant portion of the population, is based on family and informal work, within the limits of survival, without public support and facilitators⁽¹⁾. In this context, the capitalist model of production induces the need to use agrochemicals in agricultural practice in order to obtain fewer losses in crops and increase productivity⁽²⁾.

As a consequence of this production model, farmers are exposed to the direct and indirect risks inherent in the use of agrochemicals. These products can cause health effects such as insomnia, irritability, anxiety and depression, bradycardia, bronchial and intestinal spasms, salivary and lacrimal gland stimulation, convulsions, drowsiness, fatigue, headache, mental confusion, lethargy and cardiovascular problems⁽³⁾.

Another relevant fact is the increase in the number of deaths and intoxications related to the use of pesticides in Brazil. In Brazil between 2007 and 2014, 25,106 thousand cases of pesticide intoxication were reported by the Ministry of Health in addition to this, for each notified case, there were another 50 that were not non-notified, representing a ratio of 1:50,

with reported cases only 2% of the total⁽⁴⁾.

In this same period, there were still 1186 cases of deaths due to pesticide intoxication and in 2013 the HM recorded 1796 suicide attempts associated with the use of agrochemicals. Still in 2013, there was a higher incidence in cases of reports of exogenous intoxication by pesticides - 6.23 cases 100,000/inhabitants⁽⁴⁾.

In this context, it is evident the need for farmers to be aware of the impacts of pesticides on health and the environment, as well as the importance of using Personal Protective Equipment (PPE) to prevent health problems for rural workers. Many cases of intoxication could be avoided with the use of adequate protection; in addition, studies may provide subsidies for actions in the Nursing work in these specific cases.

In view of this, we try to answer the following problems: what is the farmers' knowledge about the risks of intoxication due to the use of agrochemicals? The objective of the study is: to explore the knowledge that farmers have about the possible risks of intoxication by pesticides.

MATERIAL AND METHODS

The research is a quantitative, exploratory

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descriptive approach, which was carried out with rural producers from the Consolata, Manchinha, Progresso and Barrinha districts, belonging to the rural area of Três de Maio, Rio Grande do Sul. Data collection took place during the first half of 2017, from January to May.

Data from the Municipality of Três de Maio (2017) indicated a margin of 31.39% of inhabitants of the municipality living in the rural area, which totaled 4,264 people. This being the population that served as the basis for the definition of sample size, because it was in accordance with the inclusion criteria: work in the agricultural activity, reside in the municipality of Três de Maio and be over 18 years-old. Considering this population, the sample size was calculated for planning the numerical average of people who should be interviewed, using the formula proposed by Santos (2016):

Table 1. Sample calculation formula

$$n = \frac{N \cdot Z^2 \cdot p \cdot (1 - p)}{Z^2 \cdot p \cdot (1 - p) + e^2 \cdot (N - 1)}$$

Subtitle: n - calculated sample / N - population / Z - standard variable associated with the level of confidence / p - true probability of the event / e - sampling error

Source: Santos (2016) adapted by Menegat, Reolon-Costa, Caramão (2017).

In this calculation, a sample of 257 farmers belonging to the districts of Três de Maio - RS was obtained, taking into account a 90% confidence level of the calculation and a sampling error of 5%.

Data collection was carried out through the application of a questionnaire with objective questions to characterize the sociodemographic profile, as well as data collection about knowledge of the farmers on the risks of intoxication, use of protective equipment, signs and symptoms inherent in the use of agrochemicals, destination of the containers and their storage. This questionnaire was based on easy-to-understand questions, aiming to collect information of importance for the study.

The survey was carried out at the interviewees' residence. The researcher, after introducing himself, explained the purpose of the study, giving the Informed Consent Form, which the interviewee agreed to participate in the research, signed and received a copy of it. The participant responded to the form proposed above. There was no refusal of any of the participants defined in the sample to participate in the study, nor the sample lost.

Data were analyzed using simple descriptive statistics, with the method of frequency distribution and percentage, in Microsoft Excel software. The presentation of the data was done in graphs and tables. The research was submitted to the Ethics and Research Committee (CEP) of the University of Passo Fundo (UPF), in Rio Grande do Sul (RS), obtaining a favorable opinion for the data collection under Certificate of Presentation for Ethical Appreciation (CAAE) No. 61655416.0.0000.5342.

The materials with the information obtained to carry out the research included a Free and Informed Consent Term as recommended by Resolution No. 466/12 of the National Health Council/Ministry of Health (CNS/MS)⁽⁵⁾.

RESULTS

A total of 257 farmers who are 18 or older and live in Três de Maio (RS) were interviewed. Most of them are over 40 years-old, female and incomplete elementary school (Table 1). In regard to the property size (Table 1) there is a larger number of small properties. It is also worth noting the existence of medium and large rural properties and a smaller percentage of mini landowners (Table 1).

The most important crops in the interior of Três de Maio - RS are wheat, soybeans and corn, which are grown under a crop rotation system (soybean\corn in summer - wheat in winter) (Table 1). The production of vegetables and fruits corresponds to 43.58%; from this total an amount is destined for the subsistence of the family, and a part for the commercialization. Other crops produced in the lowest index are tobacco, canola, millet and oats (Table 1).

Table 1. Socio-demographic characteristics of rural workers interviewed, Três de Maio, RS, 2017.

Variables	n	%
<i>Age Group (years)</i>		
< 25	4	1,5
25 to 30	9	3,5
31 to 40	36	14,0
> 40	208	80,9
<i>Gender</i>		
Female	152	59,1
Male	105	40,8
<i>Education</i>		
Illiterate	2	0,7
Incomplete Elementary School	162	63,0
Complete Elementary School	23	8,9
Incomplete High School	18	7,0
Complete High School	41	15,9
Incomplete Graduate Degree	4	1,4
Complete Graduate Degree	7	2,7
<i>Property Size</i>		
Smallholdings (Smaller than 1 ha)	8	3,1
Small (1 to 20 ha)	113	44,3
Medium (21 a 50ha)	93	35,8
Large (Larger than 50 ha)	43	16,7
<i>Cultivated species</i>		
Wheat	236	92,2
Soy	231	90,2
Corn	221	86,3
Vegetables and fruits	111	43,5
Smoke, canola, millet and oats	15	6,2

Most interviewees are aware of the effects and risks that incorrect and excessive use of pesticides can cause to health, as well as the chronic consequences such as the onset of cancer

and malformations. It is also observed that most of the studied sample makes use of pesticides or comes into direct contact with these products (Table 2).

Table 2. Knowledge of rural workers regarding pesticides, intoxications and use of PPE, Três de Maio, RS, 2017.

Variables	n	%
<i>Knowledge of pesticide risks</i>		
Yes	256	99,61
No	1	0,39
<i>Cancer x malformations</i>		
Know about it	255	99,22
Don't know about it	2	0,78
<i>Users of pesticides</i>		
Use	162	63,04
Don't use	95	36,96
<i>Intoxication</i>		
Have been diagnosed	46	17,90
Have never been diagnosed	211	82,10
<i>Symptoms signals</i>		
Mucosal irritation	12	5,0
Nausea/vomiting	83	32,0
Dizziness/malaise	107	41,0
Headache	41	16,0
Skin injury	14	6,01

Most of the analyzed sample was never diagnosed with pesticide poisoning, even though it had some associated sign or symptom. Among the signs and symptoms evidenced in the body at times of greater use of pesticides in the

inhabited/worked area, most mentioned dizziness and malaise; others reported having nausea, vomiting, headache crises, and skin lesions (Table 2).

Most participants said they use Personal Protective Equipment. However, it is noted that farmers do not use PPE in an appropriate way, opting for one or another accessory, even knowing the risks associated with contact and

exposure to pesticides. The most used PPE are boots, gloves and mask, waterproof clothing is used in 12.0%, waterproof hat (15.3%) and glasses 3.7% (Table 3).

Table 3. Use of PPE, periodicity, storage and destination of agrochemical packaging. Três de Maio, RS, 2017.

Variables	n	%
<i>Use of PPEs</i>		
Yes	139	54,3
No	118	45,6
<i>Types of PPE used</i>		
Gloves	60	23,4
Glasses	9	3,7
Masks	52	20,3
Waterproof hat	39	15,3
Boots	67	25,4
Waterproof clothing	30	12,0
<i>Frequency use pesticides</i>		
During the crop cycle	178	69,7
Monthly	46	17,2
Weekly	15	6,1
Occasional	18	6,7
<i>Location of pesticides storage</i>		
Shed	216	84,3
Exclusive location	37	14,4
Do not stock	4	1,6
<i>Destination of packages</i>		
Shed	7	2,4
Burn	57	21,6
Burial	7	2,4
Reuse	10	4,9
Return to supplier	176	68,5

Regarding the periodicity of the use of these products, 69, 7% use only during crop cycle as a form of pest and disease control in the crop. Others still come in contact with pesticides monthly, weekly and occasionally for miscellaneous repairs, such as in the plantations around the house or in the vegetable gardens themselves (Table 3).

Regarding the storage location of the pesticides still in use, most of the interviewees keep the shed where other products such as feed, fertilizers, seeds, agricultural machinery and even food collected from the plantations are stored and used for human and animal consumption, that is , not complying with the minimum safety rules established by regulatory agencies (Table 3). Only 14.4% of the interviewees have an exclusive place to store these products, and a minority does not stock, that is, they buy the product, use it and then eliminate it (Table 3).

Regarding the final destination of the packaging, 68.5% of the farmers return to the

supplier of the product, that is, complying with Law 9.974 of 06 June 2000⁽⁶⁾, which deals with the production, packaging and labeling, transportation, storage, marketing, use and inspection of pesticides (Table 3).

Even though the majority of respondents correctly assigned empty agrochemical containers, a significant portion, burning, burying, reusing or even storing without proper care in common sheds (Table 3).

DISCUSSION

Although the sample studied is predominantly female, the application and preparation of agrochemicals is predominantly prepared by male, a fact that is a reality at a national level, since most of the farms where soybeans, wheat and corn are grown are managed by men^(7,18).

On the other hand, the women who work in the agricultural area usually dedicated to hand weeding and horticulture. In this way, the results

of this research reaffirm those ones that were obtained in the study carried out in Minas Gerais, which highlights the conditions of exposure of these women, since they may not use PPE in these different activities.

The low level of schooling observed may result in a public health problem. Previous studies have demonstrated that this is one of the factors associated with the risk of pesticide intoxication, due to the difficulties in reading and interpreting the safety instructions on the labels, the lack of knowledge of the producers about the risks inherent to the use of pesticides and the correct way of management of these products^(8,12).

It can also be inferred that workers from small farms, who live in a family farming or intensive farming systems, are susceptible to intoxication, since the level of knowledge is generally lower, they have technical guidance, and work with equipment with less technology employed^(8,11).

The results concerning the knowledge of the producers about the risks associated with the use of pesticides corroborate, with the study carried out in two municipalities of Rio Grande do Sul, whose objective was, to apply a socioenvironmental approach in relation to human health and rural work, in which the interviewees reported having knowledge of the carcinogenic and mutagenic potential of these chemical substances^(9,14).

However, they differ from the results presented in a survey carried out in the municipality of Pelotas, where as subjects were smokers, where it was observed that farmers do not have knowledge about the health damage caused by pesticides and even confuse the symptoms with another type of pathology^(10,16).

The fact low index of farmers diagnosed by intoxication by such chemical agents may be related to the incorrect diagnosis of health professionals in this situation. It is noteworthy that even with typical acute signs and symptoms present, these are related to pesticide poisoning only when the farmer reports that he used the product beforehand, as identified in a study carried out in Ceará with farmers linked to the Union of Rural Workers of a municipality of the said state⁽¹¹⁾.

The same signs and symptoms reported in this study, by the use of pesticides, were described by farmers interviewed in coffee farms located in the state of Minas Gerais, with the objective of identifying signs and symptoms indicative of intoxication⁽¹²⁾. As in the case of farmers from the northwestern region of the State of Rio Grande do Sul, where it was observed that the symptoms mentioned by the interviewees are compatible with the exposure to pesticides and identify cases of acute intoxication^(13,14,17).

Although farmers claim to use PPE, they do not use it properly, opting for one of the equipment according to availability and convenience. The same was evidenced in interviews with rural workers in Minas Gerais and Paraná, who believed that only the use of mask or gloves could prevent possible intoxication and that it was only caused by ingestion or breathing and not by the skin⁽¹⁵⁾.

The non-use or inappropriate use of PPE may occur due to the lack of professional guidance, and that producers need more instructions, support and awareness regarding the use of PPE and the risks that the use of pesticides offers^(15,16).

Another worrying aspect, which poses a risk to health, is the storage place for pesticides, since the fact that the pesticides still in use, not stored correctly collaborates for acute human intoxications, where the signs and symptoms are better known, but often confused with other common diseases^(17,18).

Regarding the destination of packaging, most farmers comply with Law 9.974 of June 6, 2000⁽⁶⁾, which deals with the production, packaging and labeling, transport, storage, marketing, use and inspection of agrochemicals, returning them to suppliers.

CONCLUSION

Farmers are aware of the risks associated with the use of pesticides, and have already felt some signs or symptoms associated with intoxication such as nausea, vomiting, dizziness, malaise and headache, but they have not had a diagnosis of intoxication.

Non-diagnosis may be related to the low demand for medical care and the incorrect

diagnosis of health professionals in this situation, where even with the typical acute signs and symptoms present, these are related to pesticide intoxication only when the farmer reports having used the product before it occurred.

They use personal protective equipment, but not properly, as they choose one or another accessory according to convenience and availability. The PPE most used by farmers are boots, gloves, masks and waterproof clothing.

Most farmers comply with Law 9,974 of June 6, 2000⁽⁶⁾, which deals with the production, packaging and labeling, transport, storage, marketing, use and inspection of pesticides,

suppliers, but make the producers bought in an inappropriate place.

Research such as this can strengthen the effectiveness of existing public health promotion policies for rural workers and simultaneously help in the construction of new proposals that benefit agricultural work and the prevention of aggravations resulting from this work.

It is important to emphasize the importance of the continuity of studies that involve this theme and that specifically identify aspects that involve the work of nursing professionals to the health of the rural worker, serving as a reflection and action in the promotion and prevention of diseases to this risk group.

CONHECIMENTO DOS AGRICULTORES SOBRE RISCOS DE INTOXICAÇÃO PELO USO DE AGROTÓXICOS

RESUMO

Objetivo: explorar o conhecimento dos agricultores acerca dos riscos de intoxicação pelo uso de agrotóxicos. **Métodos:** foi desenvolvida pesquisa de caráter quantitativo do tipo descritivo exploratório, que foi realizada no município de Três de Maio – Rio Grande do Sul, em uma amostra de 257 agricultores. Os dados foram coletados por meio de um formulário com questões objetivas durante o primeiro semestre de 2017. As análises dos resultados basearam-se na análise estatística descritiva. **Resultados:** os agricultores possuem conhecimento dos riscos associados ao uso de agrotóxicos, e já apresentaram algum sinal ou sintoma associado à intoxicação como náusea, vômito, tontura, mal-estar e cefaleia, porém não tiveram diagnóstico de intoxicação. Os agricultores fazem uso dos equipamentos de proteção individual, porém não de forma adequada e cumprem a Lei nº 9.974 de 06 de junho de 2000⁽⁶⁾ quanto ao destino das embalagens. **Considerações finais:** pesquisas como esta podem fortalecer a efetivação das políticas públicas já existentes de promoção à saúde dos trabalhadores rurais e, simultaneamente, auxiliar na construção de novas propostas que beneficiem o trabalho agrícola e a prevenção de agravos decorrentes deste trabalho.

Palavras-chave: Agrotóxicos. Saúde do trabalhador rural. Promoção em saúde.

CONOCIMIENTO DE LOS AGRICULTORES SOBRE LOS RIESGOS DE INTOXICACIÓN POR EL USO DE PESTICIDAS

RESUMEN

Objetivo: explorar el conocimiento de los agricultores acerca de los riesgos de intoxicación por el uso de pesticidas. **Métodos:** fue desarrollada una investigación de carácter cuantitativo del tipo descriptivo exploratorio, que fue realizada en el municipio de Três de Maio – Rio Grande do Sul-Brasil, en una muestra de 257 agricultores. Los datos fueron recolectados por medio de un formulario con cuestiones objetivas durante el primer semestre de 2017. Los análisis de los resultados se basaron en el análisis estadístico descriptivo. **Resultados:** los agricultores poseen conocimiento de los riesgos asociados al uso de pesticidas, y ya han presentado algún síntoma asociado a la intoxicación como náusea, vómito, mareo, malestar y cefalea, sin embargo no tuvieron diagnóstico de intoxicación. Los agricultores hacen uso de los equipos de protección individual, pero no de manera adecuada; y cumplen la Ley nº 9.974 de 06 de junio de 2000⁽⁶⁾ en cuanto al destino de los embalajes. **Consideraciones finales:** investigaciones como esta pueden fortalecer el cumplimiento de las políticas públicas ya existentes de promoción a la salud de los trabajadores rurales y, simultáneamente, auxiliar en la construcción de nuevas propuestas que beneficien el trabajo agrícola y la prevención de agravos provenientes de este trabajo.

Palabras clave: Pesticidas. Salud del trabajador rural. Promoción de la salud.

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