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Perception of risks to the use of agrochemicals by high school students in rural areas in the District of Lucialva, Jauru - MT

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Abstract. The present research had as objective to investigate the perceptions of high school students regarding their knowledge as well as the use of agrochemicals. The investigation was carried out by means of a questionnaire to 83 high school students from the Juscelino Kubitschek de Oliveira State School in the district of Lucialva, in the county of Jauru-state of Mato Grosso, addressing issues related to agricultural chemicals as well as the frequency of use of these products, the use of personal protective equipment, knowledge about the harmful effects of agrotoxic use on the environment, human health and the evils of this product, and the need to work on the agrotoxic theme in the classroom. The analysis of the results showed that the interviewed students mostly have contact with agrotoxic, little knowledge about the information and the handling of these products as well as the inappropriate use of Personal Protective Equipment being critical the risk of intoxication by the agrotoxic. Therefore, it is necessary to work on this theme at school and in the community in order to raise awareness and raise awareness among families about the harmfulness and the risks of poisoning with agrochemicals.
Keywords: Young, Agrochemicals, health

Introduction

Brazil is one of the largest agricultural producers and in order to maintain such production, this sector uses intensively transgenic seeds and chemical inputs, such as fertilizers and agrochemicals, in relation to the use of agrochemicals Brazil from 2008 occupied the largest post in the largest consumer of agrochemicals (CASSAL et al., 2014).

Agrochemicals are considered one of the main risk factors for human health. When used, it may, in addition to contaminating the environment, also affect the health of the urban or rural population with carcinogenic, mutagenic, teratogenic, neuroendocrine effects, respiratory difficulties, memory and skin, depression, among others (FERREIRA et al., 2014; NASRALA NETO et al., 2014).

Although agricultural chemicals show themselves as a global problem, it is still little problematized in the mass media, especially in formal education, at the different levels at which it operates. The television and print media argue that pesticides are harmful to human health, but it does not address the problem in depth, even masking the seriousness of the use of pesticides in food (FERNANDES &STUANI 2015)

It is noticed and several investigations are verified that the majority of users who know or use pesticides know that these products are harmful to health. However, research indicates that this perception of the danger and the harmful effects of pesticides is insufficient as observed by Viero et al. (2016) with rural producers in a rural district of a municipality in the interior of Rio Grande do Sul where they are aware of the possibility of intoxication after inappropriate use of pesticides, but they do not always transform their knowledge and personal experiences into safer practices and attitudes, such as the proper use of individual protection equipment (IPE). Botega et al. (2011), in a study carried out with high school students in the city of Agudos-RS points out that despite their involvement in family farming, they have shown little scientific knowledge about the issues surrounding the pesticide issue.

In this context, this research had the purpose of ascertaining the perceptions of high school students about the use as well as their knowledge about the harmfulness of agrochemicals.

Methods

The present research was carried out in the Lucialva district, in the county of Jauru, state of Mato Grosso, in the year 2017, 420 km distant from the Capital, Cuiabá. The district of Lucialva is located 22 km from the county of Jauru, its economic base is agriculture with pastures predominating for dairy cattle, beef cattle and small corn farms.

For this study was based on a descriptive exploratory research (survey) with the use of a questionnaire, the research population consisted of 83 high school students from the State School Juscelino Kubitschek de Oliveira, this school unit has as a characteristic to attend students from the rural and urban perimeter of Lucialva District. The School serves students from the 1st year of elementary school to the 3rd year of high school.

The data were collected individually in the educational institution, through the application of a semi-structured questionnaire according to the research objectives, consisting of questions that initially contemplated the general information of the participant (gender, age and residence (rural or urban area) and then of 14 questions that sought to understand the interviewed student's knowledge about pesticides and their possible harmful effects. The analysis of the answers was qualitative and quantitative using descriptive statistics using Microsoft Excel 2013 software.

Results and discussion

First, the students' profile was identified in order to know the universe in which they are inserted, the secondary students are 55% male and 45% female, 68% aged 14 to 16 years, 22% have ages between 17 and 19 years and 10% above 20 years (Table 1).

Regarding the place of residence, it was observed that 80% live in the rural area of the District of Lucialva, through this result we can infer that the high school students attending school are mostly close to the field environment and the use, handling or exposure to agrochemicals because they live in rural areas. A survey conducted by Mello & Silva (2013) showed that 97.5% of the interviewees who lived in the rural area had already been hospitalized for agricultural chemicals-related intoxication, ie students in the present study may be susceptible to possible intoxication.

When asked about length of time in the rural area or urban perimeter, 73% said that they live in rural areas for more than 10 years and 27% reported less than 10 years (Table 2).

This shows that students are exposed to the harms of agrochemicals for many years. According to Savi et al. (2010), it is not only the workers who are exposed to agricultural chemicals, but also the child and youth population, for the aforementioned author it is common in these areas of work that children and especially adolescents participate in the work of home and field, making significant their exhibitions to agrochemicals, which would be a risk factor for the age group and that would eventually compromise the physical, intellectual and cognitive development of children and adolescents and the learning process at school and at work.

Table 1: Profile of the high school students of the Juscelino Kubitschekde Oliveira School of the District of Lucialva in the County of Jauru.

Social Profile		
Genre	**n**	**(%)**
Male	46	55
Female	37	45
Age	**n**	**(%)**
14 to 16	55	68
17 to 19	19	22
More than 19	09	10
Study year	**n**	**(%)**
1º year	24	29
2º year	34	41
3º year	25	30
Residence	**n**	**(%)**
Urban	15	18
Rural	66	80
Did not inform	02	02

Table 2 - Time of residence of the high school students of the Juscelino Kubitschek School of Oliveira of the District of Lucialva in the County of Jauru.

Interviewers of rurals	**n***	**(%)**
> 12 years	51	73
< 10 years	15	27
Total	66	100
Urban Perimeter	**n**	**(%)**
± 8 years	11	73
Never live at rural zone	04	27
Total	15	100

* Two students did not respond to place of residence.

Concerning the main activity developed by the family of the interviewees, a predominance of farming and livestock farming occurred, making up 75% of the results (Table 3). This type of family activity emphasizes that the students of this research are exposed to agrochemicals, since the uses of these chemical components are present in applications in pest control and in cattle for vector control. For Santana et al. (2016), health impacts from agricultural chemicals use may affect the applicators of the products, community members and consumers of food contaminated with waste, but undoubtedly the first category is the most affected.

Table 3: Activities developed by the high school students of the Juscelino Kubitschek de Oliveira School in the Lucialva District in the County of Jauru.

Family activity	
Answers	%
Crop and Livestock	75
Livestock only	03
Only Crop	00
Trade	05
Anothers	17
All	00
Total	100

When asked about participation in family life, the way in which parents help 100% of the students answered that they help parents in their home and field activities, with 51% participating in the application of agrochemicals. According to Coradini (2015), in small rural communities with family farming, as is the case of families of high school students Juscelino Kubitschek de Oliveira school, the family farming regime predominates in which young people participate in some form of the process of work.

Considering that 51% made or makes use of agrochemicals in family activities, it was also asked if they already participated in lectures or courses, if they know the package leaflet and if they know about the toxicity factor of the chemicals.

Considering the participation in lectures or courses related to the chemicals used in agriculture theme, it is noted that 61% did not participate in any of these events (Table 4), and any participation would add knowledge itself, minimizing possible intoxication with these products.

Tabela 4 - Use and/or handling of agrochemicals by high school students Juscelino Kubitschek de Oliveira School in the rural district of Lucialva District in the County of Jauru-MT.

Information on agrotoxic	Yes	No	No answer
Participation in lecture or course on the use of agrochemicals	23%	61%	16 %
Has read the label and/or package insert of a agrochemical packaging	11%	81%	8 %
Is aware of the toxicity of agrochemicals	8%	86%	6 %

When asked about the reading of the labels or inserts, the results are even more worrisome, because if it is a question of students who are attending high school, the habit of searching for knowledge through reading practice should be exercised. Reis & Duarte (2017), considers that reading is a divisor in the life of every human being, since it opens a range of new discoveries, fosters the personal growth that, consequently, reflects from the social life. However, despite the availability of information contained in the leaflets and labels, a low index of reading of these prescriptions by parts of users of agrochemicals.

Regarding the toxicity of agricultural chemicals product, 86% answered that they had no knowledge. Souza et al. (2017) reports that chemicals can be highly toxic to a number of non-target organisms, including humans. The low level of education of those who directly handle agrochemicals in the field is a very serious problem, which turns against the whole society (BOHNER et al., 2013).

Considering the factor of not reading and participating in courses or lectures does not surprise the high level of lack of knowledge or preparation for the handling of these products. According to Botega et al. (2011) it is worrisome to realize that young people who have direct or indirect contact with such substances, demonstrate ignorance about the subject. The low knowledge may be related to the lack of technical assistance received by field residents for the correct handling of these chemical agents, aggravated by fact that, in some localities, this assistance is provided by technicians involved in the trade of agrochemicals.

Table 5 shows the results regarding the definition of agrochemicals exposed by students, with 78% responding that chemcials are a type of harmful substance. Of these, 31% pointed out that agrochemicals as a poison. In a study carried out with rural workers from the city of São Paulo, Brazil, 97.2% of the interviewees used the word poison to describe agricultural chemicals (RECENA et al., 2008).

Tabela 5 - Definition of agrochemicals by high school students Juscelino Kubitschek de Oliveira School in the Lucialva District in the County of Jauru-MT.

Definition of agrotoxic by students		
Answered	65	78
Did not answer	18	22
Main answers		
Poison	20	31
Chemical, toxic substances used in crop for control of insects and pests	45	25
Total	65	100

Another term used by students in the concept to the term agrotoxic was that of chemical or toxic substance. This concept is the same as Law No. 7.802 of July 11, 1989, known as the Agrochemical Law, considers: Products and agents of physical, chemical or biological processes, intended for use in the production, storage and processing of pastures, protection of native or implanted forests, and other ecosystems, as well as urban, water and industrial environments whose

purpose is to alter the composition of the flora or fauna in order to preserve them from harmful action of living beings considered harmful; substances and products, used as defoliants, desiccants, stimulators and growth inhibitors.

Regarding the use of agrochemicals, it is observed that when asked about the use of pesticides, most of the young people responded to make use of the products together with the parents, showing that this work practice is constant (Table 6). In that 84% of the parents of the interviewees make use of agrotoxic on their properties and that at the time of use they count on the participation of the whole family including young people from the age of 14 to 19 years and 58% said they already had contact direct with pesticides. In what refers to using agrochemicals 64% used to control weeds in pastures and in control of vectors of cattle and 20% in control of herbs in the garden.

Tabela 6 - Use of agricultural chemicals by the high school families of the Juscelino Kubitschek State School of Oliveira of the rural district of the District of Lucialva in the County of Jauru and its main means of combat.

Do your parents use pesticides?	**n**	**(%)**
Yes	71	84
No	13	16
Total	83	100
Have you used any type of agrotoxic?		
Yes	48	58
No	35	42
Total	35	100
Used for control of:		
Control of weeds in pastures and control in cattle	32	64
Control of herbs in the garden	10	20
Insect control: ants and caterpillars.	05	10
Control of all types of pests	03	06
Total	48	100

Regarding the 48 students who already use chemicals products, he asked if after the use of some type of pesticide he felt some discomfort arising from the activity, in which 37 said they had adverse reactions in the body representing 77%. These are caused by malaise The use of pesticides for headache was cited by all students who reported having had a malaise after the application of agrotoxic, dizziness cited 28 times, nausea 19 times, vomiting and abdominal pain 11 times and other reactions 9 times (Figure 1). Mello & Silva (2013) points out that the main symptoms of agrochemicals poisoning are headache, belly pain and dizziness.

Regarding the use of personal protective equipment, many have stated that they do not use any type of protection (59%) although they are aware of these equipments and their efficacies, they consider that they should use them. Of those who used PPE in the agrochemcials application, they stated that they had used gloves, overalls and rubber boots, glasses, masks. Bohner et al. (2013) report the same deficiency regarding the use of this equipment with rural workers in Chapeco-SC in which the majority of agrotoxic applicators do not excel in their own safety. For Fonseca et al. (2007) the question of the non-use of protective equipment is related to the lack of information and cognitive perception of the risks present in the work process.

Regarding students' perception of the risks of agrotoxic to the environment, of the 83 students interviewed, 66% answered that they recognize that chemicals cause environmental impacts, even though they are aware of the harmful factors of agrochemicals, it is worth noting that there is a considerable percentage of families making use of these products. Pignati et al. (2017) reports that the lack of state surveillance and incentives for agroecological production increase the use of agrochemicals.

In Figure 2, the types of impacts to the environment related to agrotoxic in the interviewees' perceptions are described, 53 times environmental pollution, 48 times contamination of rivers, soil contamination 44 times, contamination of plants and water 32 times and 21 cited the destruction of flora and fauna. Environmental degradation has long-term consequences and its effects may be irreversible. For Veiga et al. (2006), the application of agrochemicals can contaminate the soil and water systems, culminating in an environmental degradation that would result in health damage and significant changes in ecosystems.

Part of those involved in the research that conceptualized the term agrochemicals, as poison or a chemical or toxic substance, and typical symptoms of intoxication were headache, dizziness, vomiting, nausea, abdominal pain and others (Figure 1). In view of these results, it can be verified that students associate agrotoxic with certain human health effects such as cancer, body aches, intoxication, among others (Figure 3).

The use of agricultural chemicals is considerable for students and their families, however the formats adopted for the handling of these products need to be re-analyzed so that they can be used more safely, due to their dangerousness. The lack of individual protection equipment was noticeable, products of great importance in the act of application. In this scenario, it was evident that the interviewees' search for information was critical in participating in courses, lectures and in the reading of the package leaflet.

It is necessary to work in the school and in the community on the agrotoxic subject, so that it can increase the level of perception about the degree of dangerousness of these products when they are handled incorrectly. Another factor is to lead society to create habits that minimize the use of these products and that the losses already caused by the use of agrochemicals are mitigated by the families.

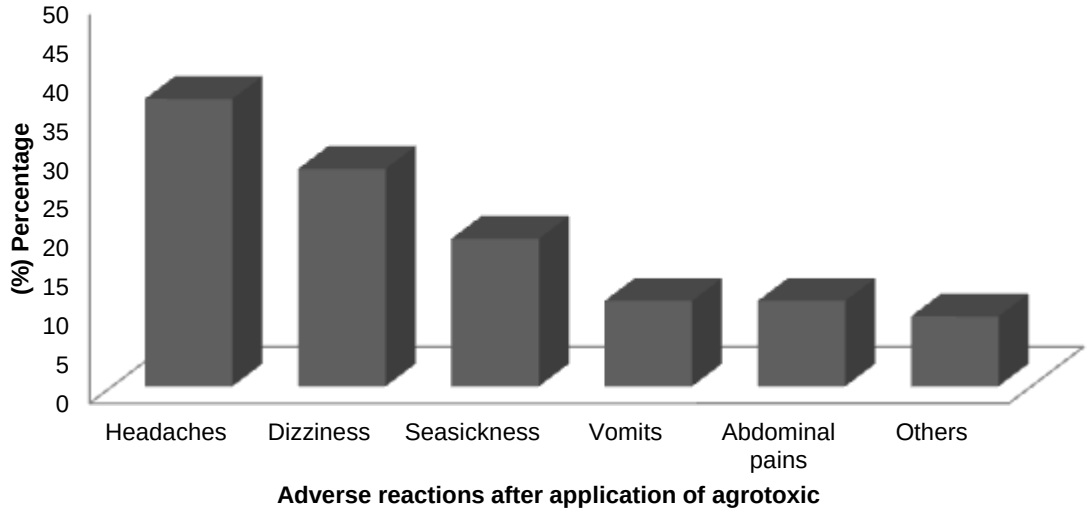

Figure 1 - Main symptoms related to exposure to agrochemicals reported by the high school students of the Juscelino Kubitschek State School of Oliveira of the District of Lucialva in the County of Jauru-MT.

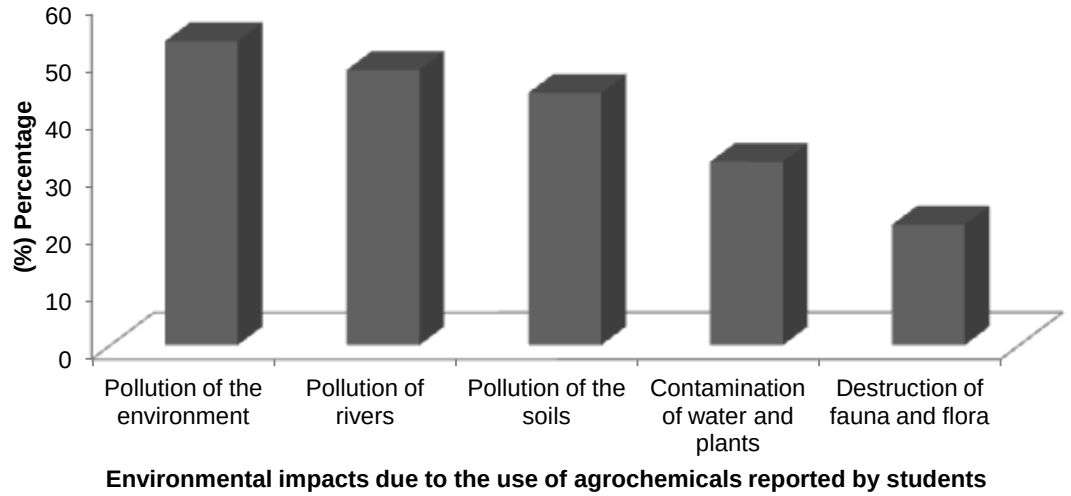

Figure 2- Relation of the environmental impacts mentioned by the students of the State School Juscelino Kubtchek of Jauru, state of Mato Grosso, due to the use of agrochemicals.

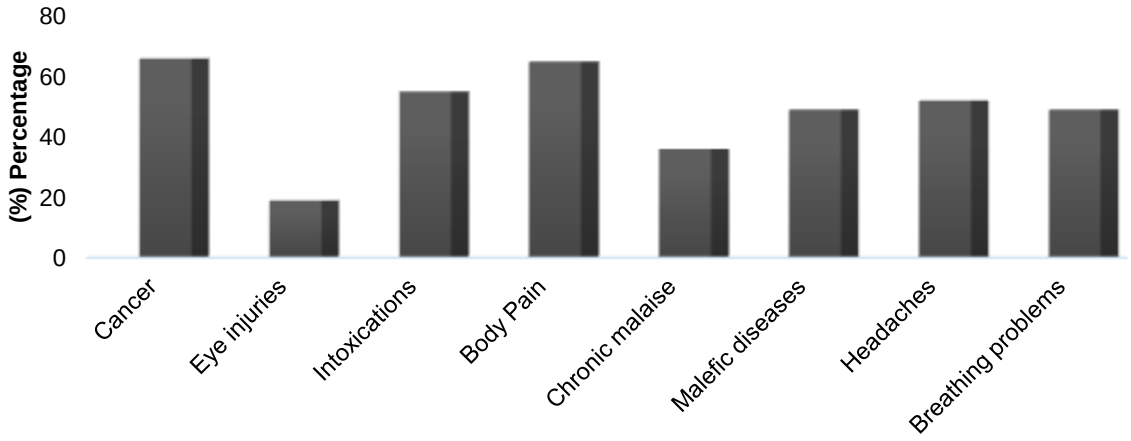

Figure 3 - Problems due to the use or intoxication with agrochemicals in the students' perception of the Juscelino Kubitschek School of Oliveira District of Lucialva County of Jauru-MT.

Conclusion

Through the data presented and discussed in this article, a worrying scenario was observed, since the students demonstrated low knowledge about the agrochemicals, at the same time that they evidenced to have direct or indirect contact with them. It shows the need for agricultural extension programs that provide technical assistance, as well as the development of teaching and learning focused on environmental education focused on the rational and safe use of agrotoxic, thus guaranteeing quality of life for this population.

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