

# Risk society: the use of pesticides and implications for the health of rural workers

*Sociedade de risco: o uso dos agrotóxicos e implicações na saúde do trabalhador rural*

*La sociedad del riesgo: el uso de pesticidas y las implicaciones para la salud de los trabajadores rurales*

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## ABSTRACT

**Objective:** To know the perceptions of rural workers about the risks arising from the use of pesticides for health. **Methods:** Descriptive study, with a qualitative approach, developed with 15 rural workers in a city in the interior of Rio Grande do Sul, BR. Data were collected through socioeconomic form and semi-structured interviews during the months February to April 2014 and analyzed based on thematic content frame. **Results:** It was observed that farmers know the risks related to the use of pesticides for their health and the failure to use personal protective equipment. **Conclusions:** There is no adoption of preventive measures by the participants, with the need for actions aimed at the health of these workers.

**Keywords:** Rural health; Occupational Health; Pesticides; Risk; Nursing.

## RESUMO

**Objetivo:** Conhecer as percepções de trabalhadores rurais sobre os riscos advindos do uso de agrotóxicos para sua saúde. **Métodos:** Estudo do tipo descritivo, com abordagem qualitativa, desenvolvido com 15 trabalhadores rurais em um município do interior do Rio Grande do Sul, BR. Os dados foram coletados por meio de formulário socioeconômico e entrevista semiestruturada, durante os meses de fevereiro a abril de 2014 e analisados com base no referencial de conteúdo temática. **Resultados:** Evidenciou-se que os agricultores conhecem os riscos relacionados ao uso de agrotóxicos para sua saúde e a não utilização dos equipamentos de proteção individual. **Conclusões:** Não há adoção de medidas preventivas pelos participantes, com a necessidade de ações direcionadas à saúde destes trabalhadores.

**Palavras-chave:** Saúde da população rural; Saúde do Trabalhador; Praguicidas; Risco; Enfermagem.

## RESUMEN

**Objetivo:** Conocer las percepciones de los trabajadores rurales sobre los riesgos derivados del uso de plaguicidas para la salud. **Métodos:** Estudio descriptivo, con abordaje cualitativo, desarrollado con 15 trabajadores rurales en una ciudad del interior de Rio Grande do Sul, BR. Los datos fueron recolectados a través de formulario socioeconómico y entrevistas semi-estructuradas durante los meses de febrero a abril de 2014 y analizado sobre la base de marco de contenido temático. **Resultados:** Se observó que los agricultores conocen los riesgos relacionados con el uso de plaguicidas para su salud y la falta de uso de equipo de protección personal. **Conclusiones:** No hay adopción de medidas preventivas por parte de los participantes, con la necesidad de acciones dirigidas a la salud de estos trabajadores.

**Palabras clave:** Salud Rural; Salud Laboral; Plaguicidas; Riesgo; Enfermería.

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## INTRODUCTION

Brazil became, from 2008, the largest consumer of pesticides, although not the world's leading agricultural producer. The abusive use of these products creates several issues, from those that affect the health of farmers, to those affecting the environment, destroying fauna and flora or, in summary, the whole of our biodiversity<sup>1,2</sup>.

The pesticides are among the products with the most relevant risk factors for the health of farm workers and to the environment<sup>3</sup>. Therefore, it is evident that the current model of economic development imposes and induces changes in lifestyle that can cause serious health problems to the worker, for example, workers exposure to pesticides in the field. These conditions affect quality of life, negatively affecting the health of rural workers and the environment<sup>4</sup>. The protection of the health of the population, based on extensive safety is inhibited and weakened by market interests, which, in turn, have an institutional framework and legislation to provide means to sustain the virtual cycle of economy, in favor of use of technical products with the support of governments<sup>5</sup>. This gives a potential risk situation, typical of modern society, where profit overrides the right to health of humans and the environment. The massive use of pesticides due to the expansion of agribusiness, in addition to intoxicate the population is contaminating the food, water and air<sup>6</sup>.

In view of this problem, the search for theoretical support in areas, such as sociology, constitutes an important strategy because it allows a better understanding of the social circumstances intrinsic to health. Modernity constitutes the civilization of risk, which includes the high consequence arising from the globalized character of the social fabric. In the universe of modernity, people live in an opportunity and risk environment guided by human control in the social and natural environment and the lifestyle adopted contemporaneously<sup>7</sup>.

In this way, we live in a time of reconfiguration of modern society that takes on new proportions address global risks<sup>8</sup>. Thus, the concept of risk society becomes important in this debate, as it expresses the accumulation of risks (ecological, biochemical, financial and informational) that are omnipresent<sup>8</sup>.

This configures a scenario of uncertainty "manufactured" by facts depending on human decisions and civilization itself, such as using pesticides in food production<sup>8</sup>.

This panorama points to the complexity of the issue, sized especially by the impact of pesticide use on the health of rural workers and populations living close to the production areas, representing a public health problem, for which the health sector seeks to define and implement actions for comprehensive care of populations exposed to pesticides<sup>9</sup>. Faced with this, the insertion of this debate in nursing is imperative in order to mobilize forces to face this situation and produce strategies to reduce or eliminate the contamination of farm workers. The perception of farmers and consumers about the high risks of using pesticides to human health and the environment is essential to change this reality<sup>10</sup>.

It is believed that the insertion of the discussion on the issue of pesticides in rural activity will enable new approaches to nursing in their care practice, teaching and research, especially when produced through the understanding of the health-disease process because of interaction of human beings with their work. Therefore, it has the general objective: to know the perceptions of rural workers about the risks arising from the use of pesticides for their health.

## METHODS

The research is descriptive and exploratory with a qualitative approach was conducted in a rural district of a city in the interior of Rio Grande do Sul, BRA, with an agricultural cultivation based economy. This study included rural workers in the district concerned, adopting inclusion criteria the worker be of legal age (18 years); be involved with agriculture for more than one year (justified by the need for experience in rural work) and reside in the countryside. There was an exclusion criterion, a member of the same family, considering the first degree of kinship, since the object of study was not the family.

Participants were selected by manual sorting, held by the researcher, in possession of the completed list, along with the administrative sector of the District Administration. After sorting, we were contacted by telephone, on the possibility of participate in the study as well as asked about meeting the inclusion criteria and explained about the purpose of the research. Fifteen workers were interviewed, out of 30 farmers belonging to the district, and the data collection based on the criterion of saturation<sup>11</sup>.

Two data production tools were used, i.e. the form of socio-economic survey data and semi-structured interview. The form contained closed questions in order to gather information such as gender, age, origin, education, data on agricultural crop and handling of pesticides. These were collected together and prior to the semi-structured interview, in order to establish a profile of the participants. The semi-structure interview was comprised of questions that approached the understanding of workers about risk, about his routine in rural labor and the use of pesticides in labor activity.

The interviews were conducted in the period from February to April 2014, in the very setting of research in local and hour of the preference of the respondent. It has requested authorization for recording the information gathered that were later integrally transcribed and digitized. All interviews were conducted in the homes of workers; in a reserved environment; ensuring the necessary privacy for its effectiveness, with a duration of 60 minutes, including filling out the form by the researcher.

The transcribed data were analyzed based on the proposed framework for thematic content analysis, which is a research technique that allows replicate and validate inferences about data for a particular context, through specialized and scientific procedures<sup>12</sup>. Thus, it was organized the thematic content analysis in three steps and there was the interpretation of the content in accordance with the relevant theoretical reference to the study.

The research was conducted considering Resolution N° 466, 2012 of the National Health Council, under Presentation Certificate of Appreciation for Ethics - CAAE N° 26425513.7.0000.5346, with a commitment to ensure the privacy and confidentiality of the data used, preserving the identity and anonymity of study participants. For the presentation of the results, the participants were identified with the letter 'R' and a number indicating the order of interviews.

## RESULTS AND DISCUSSION

The analysis of the socioeconomic profile of survey participants showed that all, 15 individuals were males. Age ranged between 37 and 67 years, and 10 were in the range between 41 and 60 years. All respondents were married, they had 14 children, of which six had at least one child involved to agricultural activity.

The main food products by participants were rice and soya and all respondents mentioned use more than one class of pesticides (herbicides, fungicides and insecticides), by means of aerial spraying or mechanical (with tractor). All respondents said they did not reuse packaging, returning them to the company that provides after use.

The totality used of pesticides according to prescription agronomist of the supplier companies of these substances. Among the participants, 11 used pesticides in rural business for over 30 years, which confirms the severity of chronic exposure, underscored by the scientific literature<sup>5,13</sup>.

For better understanding of this study, obtained statements and reflections were subdivided into thematic categories. For the composition of this manuscript, it was selected one of them: the use of pesticides and the health of rural workers, as described below. The other, directed to analyzing the sociological approach of the risks of modernity and environmental crisis related to the issue of pesticides are part of another scientific publication.

For the production of data, participants were asked about their perception about the relationship between the use of pesticides and their health as rural workers. The deponents have known of the risks that the use of pesticides can cause, as shown in the statements:

*Some time ago all went by, sometimes we didn't even own. When we started planting we had no masks or gloves. We applied with nothing after coming things [illness] we do not know how the guy is in good health, for all the guy passed (R4).*

*These days I said, many people are feeling something because of the poison. [...] People who do not use protection are feeling, headaches, stomach aches, many are impaired, do not use the equipment they should (R8).*

The Participants mentioned that the risks of contamination were associated to the application of pesticides; possible impact of non-safety practice, such as not wear an protective personal

protection (PPE); and, the symptoms of an acute poisoning. They has also asking to themselves about the future risks and consequences to the labor activities practiced contemporaneously.

As an example, it is the development of chronic diseases, such as cancer, associated to the management of and application to the pesticides, by considering the potential carcinogenic and mutagenic effect of those chemical substances<sup>14,15</sup>.

*It is a drop in a glass of water, it reach a certain point that folks (silence), it is clear that the problem already exists, there are many cases of cancer, many kind of diseases. I think that comes from there, for sure, it comes a little from there (R1).*

*It is a problem when it happens, this cancer, it is all caused by pesticides. Such diseases that are coming from this. Because, on the past, when I was a child, there wasn't nothing like that (R11).*

Thus, considering the use of pesticides, there is a possibility of the farmer worker became illnesses, as well as the understanding that this use can't be eliminated in the short and medium term, given the reality of global food production. Recognize the existence of a risk or set of them is to admit not only the probability that things can go wrong, but this can not be eliminated<sup>16</sup>. Therefore, this risk society requires other skills for survival, as the decision to anticipate dangers, to support them, to deal with them in biographical and political terms; transposing the fear and insecurity, to be converted into decisive civilizational qualification<sup>6</sup>.

It is perceived that the risks are potentially threatening to human life, directly impacting the daily activities of rural workers to the presence of toxic contents inserted in their work process<sup>16</sup>. In this way, trust and risk, opportunity and danger, paradoxical characteristics of modernity permeate all aspects of everyday life, supplanting the local and the global and excluding no one of these situations<sup>16</sup>.

In the meantime, the risks do not increase only quantitatively but also qualitatively arise, that is, are added to new formats and attributions of guilt<sup>8</sup>. Air pollution, water and food from pesticides probably increase the problems, not only in the physiological sense, but also in the psychological sense<sup>17</sup>.

In a way, this is the experience of "Destination Nature" produced by civilization, where the individual experiences and suffers derived the restlessness of its technical constructiveness and global society<sup>17</sup>. Thus, there is no human being ignore the fact that their working activities (labor) are influenced and many times determined by events or distant organisms<sup>18</sup>, as in the case of the use of pesticides in agriculture and the global agribusiness.

Hence, from the choices of lifestyle options are frequently curtailed by factors that are beyond reach of the individuals they affect. Technological changes (agricultural machinery, pesticide use, etc.) that are imposed on people's lives are the result of incorporation of abstract systems, controlled by industrial corporations away from the control of the individual nonprofessional<sup>18</sup>.

Moreover, for the participants of this study, corroborating the results of other research<sup>19</sup>, there is an ambivalence situation when the denial of the threats, it is noted as a defensive strategy. This denial serves as "protection" for the mental health of those farmers who come to believe in the absence of direct dangers to their health in the short term. It is noteworthy that, this is as much as information is available, to show them otherwise and that they know, to some degree, the risks to which they are exposed.

As can be analyzed in the speech extracts the participants denied health problems related to the use of pesticides in rural activity, despite claiming the existence of occupational hazards:

*I feel nothing, so far. Who know one day things will appear ... but until now never felt anything (R3).*

*My (health) is well, for now I am good! (laughs) I can no longer deal with poison [...] the doctor has forbidden me to use poison (R8).*

*Look, I thank God with all that I applied everything I've dealt, that in these years have facilitated much more than today, and I did not feel anything until today, I had no problem, I had no disease, that thank God (R10).*

To compensate for the anxiety that these working conditions forced by the productivity needed to agribusiness can produce, there is the psychological support of the feeling that "there is nothing I can do as an individual" and anyway these risks are the product of agribusiness. Act-as-a-habit, it is a key element in maintaining the trust and ontological security, and applies with respect to health risks caused by the use of pesticides<sup>16</sup>. In this way, individuals maintain their daily routine, supported by a certain psychological protection that keeps them in a position to conduct their activities with lower levels of anxiety.

The issue of trust implies consciousness of risk circumstances of human activities - including the impact of technology on social world - and also in expectations that can be frustrated. Now, in relation to security, that can be defined as a balance of trust and "acceptable risk" or as a situation where a specific set of dangers is counteracted or minimized<sup>16</sup>.

This can be named as protective cocoon, that is, is a "bracketing" potential facts that seriously considered in view of the risks and dangers, would produce a kind of paralysis of the practice of daily life<sup>7</sup>. As a defense mechanism, the whole issue of pesticides and rural activity, together with the risks to workers' health, at its deepest core, is suspended so that they can continue their work practice, which derives their livelihood.

In this way the vast majority of people do not spend a lot of your time, a conscientious form worrying about such threats; which is justified by the need to move forward with the practical events of life and protect yourself psychologically<sup>16</sup>. In this sense, risk/danger and trust/security intersect and trust serves to minimize the dangers to which they are subjected certain

types of activities. In a way, this begins to be seen as "acceptable risk" - applied in different contexts of life - minimizing the danger, it is usually central in maintaining security<sup>16</sup>.

In this way, the meaning of the routines should not be underestimated and is essential for safety, because structuring provides a basis for the continuity of life through different contexts of action<sup>18</sup>. This data may be related to the fact that participants feel "safe" against their work routines, which can justify the incorrect use of PPE.

The susceptibility to the threat does not necessarily culminates in risk consciousness, and may also cause the opposite: the denial by fear. Together with the dimension of danger, it increases the likelihood of their denial and minimization and unthinkable this, with which we must live, however, the perception of risk is essential to overcome it<sup>8</sup>.

In this individualized society, the human being must learn to be recognized as the focus of action, planning their lives with respect to his own career, under penalty of irreversible damage to their health. It is required of the individual, a dynamic model of everyday action in which decision-making is always present, in order to ensure their survival, bringing as a result, the subjectivity and individualization of risk<sup>8</sup>. For this reason, nursing has the potential to help farmers through educational strategies in order to seek to develop an awareness about being/living in risk society to make their decisions related to care for your health.

On the occurrence of health problems related to the use of pesticides in general the participants denied the existence thereof.

*No, as soon as I remember never had poisoning. [...] But never got sick because of pesticides. But catching poison, already I caught a few times. In case gives a wind, a whirlwind. The person who says he never took poison lie because grabs poison yes (R1).*

*No, never. Thank God! Thanks to God and thanks to care, because we have to be careful with it (R12).*

However, some respondents answered in the affirmative. But it was not immediately related, requiring instigation on the part of interviewer and not all were able to relate to the use of pesticides, as evidenced:

*Sometimes the headache, but I guess it is not because of the poison. But never happened when I had applying to me these problems and we care a bit (R5).*

*Oh I had. I did not go to hospital, but had a week with stomach pain, headache, and was already sick. And then I had no other means. I stopped (R8).*

In acute poisoning, clinical and laboratory symptoms are better known, facilitating the diagnosis and treatment of the worker. However, the farmer is exposed to several products at

the same time, along many years by different routes (dermal absorption, inhalation, ingestion), both in the field, by means of the preparation and the pesticide application, as the residence via the improper storage and handling of the clothes used in spraying, chronic intoxications is covering up that are more difficult to relate to<sup>13</sup>. As pointed out by the workers of this study, they use various classes of these chemicals, without mention the prolonged exposure because many of them use pesticides for over 30 years.

Knowing the severity of poisoning in workers, by pesticides, it is essential for the control of mortality, the existence of a surveillance system for effective and integrated health. Its structure will allow, to the Sistema Único de Saúde (Unified Health System), the care extended to the health of populations in the various production processes in which pesticides are used, guided by integrative and interdisciplinary approaches. This will also contribute to the development of an ecological and sustainable agricultural model in Brazil, to preserve the health of rural workers<sup>9</sup>.

Considering that the work processes in the contemporary, are becoming more dangerous; causing damage to human health, especially the workers, we live in a time of construction of a new paradigm in relation to the discussion on the working conditions which includes the evaluation of unhealthy environments, not only in agricultural work. Therefore, register the importance of implementing public policies for this purpose becoming indispensable, to nursing, to act to preserve the health of workers<sup>20</sup>.

Viewing the world of work and their impacts on human health, by health professionals, it is essential interventions for promotion and prevention. In this respect, labor exercise of farm workers needs to be investigated, so there is the understanding of the phenomenon, its real health needs, enabling the worker's health policy is interlace the complex networks that permeate the man-labor relationship, including in rural areas.

Thus, this study confirms that the exposure to occupational hazards in the rural activity is a public health problem, by setting up determinant of morbidity and mortality in order the consequences to health of workers, as well as economic, social and environmental. In this scenario, regulatory policies use and pesticide abuse, the inclusion of farmers in the health production process, inter linking popular and scientific knowledge, improving access to rural health, especially preventive, and mainly investments in promotion health conditions may be able to create opportunities environments to improve health care for rural workers<sup>21</sup>.

Health professionals need to be trained to identify, treat cases and perform health surveillance, with emphasis on prevention and promotion. It is very important to spread storage practices and knowledge of safe handling of these substances as more immediate way to prevent deaths and other serious effects of poisoning<sup>22</sup>. The investment in continuing education between the health professionals, both to broaden the surveillance of poisonings as educate workers to encompass more coverage this issue is essential.

It is therefore necessary to establish assessment strategies and risk management, as health surveillance, even knowing that analysis and risk management coming from problems in the relations between health, labor and the environment are complex actions. This constitutes an enormous challenge that must be faced by different sectors, governmental and non, involved in the search for a better quality of work and life for the population<sup>23</sup>.

Regarding the use of personal protective equipment, demonstrations of workers show a worrying picture:

*[...] Some time ago, you put gloves, PPE. Today as I have the tractor, the cabin pulling air from within and not only brings air from outside, for example, spray and that would pull air from outside, this has not. So today is better in this regard. With the tractor, you can go normal, but I like when it was cabin I put the mask, but would not need because it only rotates with the air inside, does not bring the outside air (R1).*

*This I'll tell you, I'm very relaxed, I'll tell you, because I do not wear glove, do not use anything for now. [...] From time to time I use glove, if not, don't use anything (R11).*

Given the above, it can be inferred that they do not properly use PPE. Also, put their expectations on the tractor, as a tool that will deliver them from the risk of contamination. This is alarming because it makes them more vulnerable to this 'false' sense of security by not using PPE and leaving the tractor, exposing the sprayed pesticides.

There is a kind of "ingenuity" of the industrial population, which many times can not interpret what is contained in the leaflets and labels, as more properly use the PPE. This provides entrepreneurs of industries producing pesticides the right of the unsuspected before the legitimate handling risk: given the impossibility of that may be to adopt safety standards, may exempt you do meet them. So they can keep a clear conscience and shift responsibility for accidents, poisonings and deaths to lack of culture of the rural population to the risks<sup>8</sup>.

In this way, workers are exposed to contamination and accidents, which correct use of PPE could minimize or avoid. Moreover, the actual context in which they are embedded is despised, to move from victims to guilty, through perverse labels such as workers' lack of awareness' or practicing unsafe acts.

Faced with this condition of vulnerability in this study, nursing should act in order to raise awareness among rural workers to the importance of the correct use of PPE of safer practices on the severity of the indiscriminate and misuse of pesticides. Address the relationship between the numerous diseases and pesticides, through acute and chronic poisoning, it can also be a useful strategy, aiming to promote health and disease prevention.

Access to information and technical knowledge promoted by participatory educational processes is essential so that farmers using pesticides in their working practices, are minimally qualified

to use them. The information must be clear and accessible contextualized, participatory, dialogical - valuing the worker, as a creative, critical and interpretive individual's reality - and be linked to a plan of overcoming reality for that communication to take place effectively<sup>20</sup>.

Moreover, advance the dialogue of services/health sectors with social movements and workers, through discussion involving the interrelation - promotion, prevention, protection, care and management - not just the diseases, is critical because it can make more understandable the health needs of rural workers. Moreover, it is essential to plan contextualized actions, able to recognize the territory, the people and their needs, to create mechanisms that reduce vulnerabilities aiming at quality of life<sup>4,9</sup>.

The interface between health issues of worker and environmental health is, nowadays, a great challenge for health professionals, including nursing, and for SUS, since in many cases, environmental degradation generated in the capitalist production process, culminating in the pollution of air, soil, surface and groundwater, causing damage to the health of workers and the public. In this sense, the relationship of these issues need to be connected to alternative models of regional and local development and the principles of sustainability and viability of the ensuring the quality of life of rural workers, the populations of the countryside and the city<sup>24,25</sup>.

In summary and is demonstrated, in this study that are necessary advances in the healthcare industry to change the reality that the rural worker is exposed, with high rates of poisoning, underreported, combined with unsafe working practices, especially those resulting from the incorrect use of EPI. Is therefore essential to reflect on how to place health practices against this problem and on its effectiveness. A proactive attitude of government agencies, the health sector, nursing and society at large to join forces with the aim of overcoming this process of risk and danger to the health of rural workers, mortality generator, triggered by the intensive use is required of pesticides in Brazilian society, aiming at a healthy working environment.

## CONCLUSIONS

The study findings show that the rural worker is aware that there are risks related to the consumption and handling of pesticides, expressing concern about the consequences. In general, deny direct association between the use of pesticides and health problems, is showing that not properly use personal protective equipment.

It is believed that this study brings contributions to performance of nursing professionals, contribute reflections on perceptions about the risk of pesticide use for farm workers, in contemporary times, which can assist in the formulation of health problems prevention actions and individuals involved in the research community as well as to all who have access to the results of this research. It points up as a strategy in this regard, conducting educational activities with rural workers, by nurses

and other health professionals on issues related to worker health and the implications of pesticide use, that are based on dialogue with a view to promoting individual and environmental health.

Among the study limitations, is found the fact that it is located and the time restriction, because it is a master's research because it is believed that an investigation had greater coverage could elucidate a broad manner the issue of pesticide use in agriculture. Finally, it is suggested to conduct further investigations that address this theme as well as the performance of nursing, through a professional practice directed to workers 'health to collaborate for the promotion of health and prevention of rural workers' grievances and to all that somehow they are exposed to the dangers of using pesticides.

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