

## Occupational risks in agricultural work and the negotiation for the health of rural workers

Riscos ocupacionais no trabalho agrícola e a negociação para a saúde do trabalhador rural

Riesgos laborales en el trabajo agrícola y la negociación para la salud del trabajador rural

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**Abstract: Objective:** to understand the relationship between occupational risks in agricultural work and the negotiation for the health of rural workers. **Method:** mixed nested concurrent study, combined with equal integration (QUAN + QUAL). It was conducted with 351 farmers, between 2014/2015, using a form and semi-structured interview. For the analysis, descriptive and inferential statistics and the descending hierarchical classification, and the word cloud were used. **Results:** in the QUAN phase, the average age of 50.58 years old was obtained and a predominance of symptoms of illness in the muscular, endocrine, and urinary systems. In the QUAL phase, it became evident that the negotiation of agricultural products increases the exposure of workers to physical, chemical, and ergonomic risks. Profit represents the goal and allows for the cost of equipment, health care, and drug therapy, through illness. **Conclusion:** occupational risks are present in agricultural work. Negotiation is reduced to the consumption of health services and products in the presence of illness.

**Descriptors:** Occupational Risks; Rural Health; Occupational Health; Negotiating; Agriculture

**Resumo: Objetivo:** apreender a relação entre riscos ocupacionais no trabalho agrícola e a negociação para a saúde do trabalhador rural. **Método:** estudo misto concorrente aninhado, combinado por integração (QUAN + QUAL) igualitária. Realizado com 351 agricultores, entre 2014/2015, por meio de formulário e entrevista semiestruturada. Para a análise, utilizou-se a estatística descritiva e inferencial e a classificação hierárquica descendente e a nuvem de palavras. **Resultados:** na fase QUAN, obteve-se idade média de 50,58 anos e predomínio de sintomas de adoecimento nos sistemas muscular, endócrino e urinário. Na fase QUAL, evidenciou-se que a negociação dos produtos agrícolas amplia a exposição dos trabalhadores a riscos físico, químico e ergonômico. O lucro representa

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o objetivo e permite o custeio de equipamentos, assistência à saúde e terapêutica medicamentosa, mediante o adoecimento. **Conclusão:** os riscos ocupacionais estão presentes no trabalho agrícola. A negociação reduz-se ao consumo de serviços e produtos de saúde em presença do adoecimento.

**Descritores:** Riscos Ocupacionais; Saúde da População Rural; Saúde do Trabalhador; Negociação; Agricultura

**Resumen: Objetivo:** comprender la relación entre riesgos laborales en el trabajo agrícola y la negociación para la salud del trabajador rural. **Método:** estudio mixto concurrente anidado, combinado por integración (QUAN + QUAL) igualitaria. Fue realizado con 351 agricultores, entre 2014/2015, por medio de un formulario y una entrevista semi-estructurada. Para el análisis, se utilizó la estadística descriptiva e inferencial y la clasificación jerárquica descendiente y la nube de palabras. **Resultados:** en la fase QUAN, se obtuvo una edad media de 50,58 años y predominio de síntomas de enfermedades en los sistemas muscular, endócrino y urinario. En la fase QUAL, se observó que la negociación de los productos agrícolas amplía la exposición de los trabajadores a riesgos físico, químico y ergonómico. El lucro representa el objetivo y permite el costeo de equipamientos, asistencia a la salud y terapéutica medicamentosa, mediante la enfermedad. **Conclusión:** los riesgos laborales están presentes en el trabajo agrícola. La negociación se reduce al consumo de servicios y productos de salud en la presencia de la enfermedad.

**Descriptores:** Riesgos Laborales; Salud Rural; Salud Laboral; Negociación; Agricultura

## Introduction

Agricultural work is characterized by human and technological manipulation of the land. Human manipulation makes men and women more vulnerable to the occurrence of health problems, through direct contact with harmful agents in the production process. On the other hand, technological manipulation reduces such contact but accelerates the production process and impacts on the occupational exposure of these workers. The exposure is perceived by the farmers at different levels and still restricted in the appropriation of knowledge and behaviors of protection and safety.<sup>1</sup>

The restriction of knowledge and behaviors of protection and security in rural work is very important for the global socioeconomic sector, as around 520 million men and 410 million women were employed in agriculture, which is the main source of jobs in most developing countries. Currently, the agriculture sector accounts for 60% of all jobs in sub-Saharan Africa.<sup>2</sup> In Brazil, the agricultural sector plays a significant role in the country's economic development, despite agriculture accounting for only 5.4% of the domestic product gross in 2010-2013.<sup>3</sup> IN the social issues, the importance is related to the distribution of income and the maintenance of the worker in the area.

Agricultural work requires physical effort and demands high consumption of human energy. Many times, it is inappropriate for the human being who, subordinated to the market economy, negotiates the agricultural product for his survival and not realizing that the risks in the work environment can cause injuries to health.<sup>4</sup>

The exposure to solar radiation for long periods can trigger skin lesions of a benign character and even skin cancer.<sup>5</sup> Noises resulting from the use of chainsaws, harvesters, and tractors can result in progressive loss of hearing, fatigue, irritability, elevated blood pressure, and sleep disorders.<sup>6</sup> Also, accidents with poisonous animals, exposure to particles of grains, mites, and pollen, which can cause respiratory diseases, such as asthma and pneumonitis, by hypersensitization.<sup>7</sup>

The division and the intense pace of work in agriculture, with demand for productivity and the presence of ergonomic problems, generate risks to the health of workers.<sup>8</sup> They have a higher prevalence of morbidities with the emergence of Repetitive Strain Injuries and Work-Related Musculoskeletal Disorders (LER/DORT).<sup>9</sup> Also, the serious intoxications are resulting from exposure to fertilizers and pesticides, products in the group of phosphates, potassium salts, and nitrates, which can cause hypocalcemia, ulceration of the gastric mucosa, hemorrhage, and cancer.<sup>10</sup>

Illnesses from this work are aggravated by the lack of professional identification/intervention and the adoption of appropriate therapy. This absence is transposed in the level of primary health care whose purpose is to promote the health of the communities. This should excel in the accessibility to services and in the execution of actions to guide agricultural workers to minimize exposure to occupational risks.<sup>11</sup>

Health guidance is characterized as part of nursing care for families in a rural environment, showing that nurses have an organization of the work process that allows them to intervene at the home/family level to enjoy interpersonal and environmental dialogic.<sup>12</sup> Dialogic represents the capture of clinical information from the group of workers to materialize the situational diagnosis.<sup>13</sup> This gathers data from the health-disease process and allows nursing

and other health professionals to negotiate, organize, plan, and schedule actions/interventions in favor of changing unsafe habits.<sup>14</sup>

In this context, the research question is: what is the relationship between occupational risks in agricultural work and the negotiation for the health of rural workers? Thus, this study aimed to understand the relationship between occupational risks in agricultural work and the negotiation for the health of rural workers.

## Method

This is a study with a mixed method of a nested concurrent type, in which quantitative and qualitative data are collected concurrently.<sup>15</sup> They are mixed by integration (QUAN + QUAL), with equal weighting. This integration was planned since the construction of the data collection instruments. Such construction was sustained by the connectivity of the variables used already scientifically advertised in several studies, for example, type, hours of work, use of pesticides and musculoskeletal disorders, low education, income and protection against occupational risks, as well as previous experiences by the collective of researchers from the Laboratory of Socio-environmental Processes and Collective Health Production - LAMSA, linked to the Federal University of Rio Grande (FURG).<sup>12,16</sup> Theoretically, it is based on the integrality of health care, specifically by understanding the established causal links between rural work and the illness of the worker.<sup>14</sup> The typification of the method is justified based on the sample selection process and access to the scenario and research participants.

Two municipalities in the state of Rio Grande do Sul (RS) were the research scenario. One is located in the south region with a territorial area of 2,709.391 km<sup>2</sup>; with a demographic density of 72.79 inhabitants/km<sup>2</sup>; municipal human development index (MHDI) of 0.744 and 35<sup>th</sup> in the state ranking for economic activity in agriculture and livestock. The western region has

5,702,098 km<sup>2</sup>, respectively; 21.95 inhabitants/km<sup>2</sup>; the same MHDI, but it is in the 4<sup>th</sup> place in the aforementioned ranking.<sup>17</sup> Such municipalities are located at a distance of 618 km, considering the displacement by highway, BR 293, covered by the group of eight researchers who performed the stages of data collection double data.

The research population, quantitative and qualitative, were 371 farm workers, defined as people responsible for managing the primary production of fruits, vegetables, grains, and other agricultural products. The computation of the population occurred due to the overlapping of data from the Brazilian Institute of Geography and Statistics (IBGE) in 2010, of Rural Workers' Unions; the Technical Assistance and Rural Extension Companies (EMATER) and the Municipal Secretariat of Agriculture, in 2013. This overlap was performed to obtain only the information of agricultural workers, excluding those from livestock, forest production, fishing, and aquaculture.

From this population, we excluded 24 farmers who did not meet the pre-established selection criteria - individuals over 18 years old, living in a rural environment, and who worked directly in horticultural agriculture. Therefore, four farmers were excluded for being under 18 years old; 12 for not living in the rural environment, and eight farmers for not working directly in horticulture., We applied the following exclusion criteria for the 347 farmers: not consenting to an audio-recorded interview and impossibility of access to the home. In this set, there was a decrease of 16 participants because 10 were not at home in the three attempts of contact during a home visit of two researchers in the company of an EMATER worker and six who did not consent to the collection of data. The total of participants in this study was 331.

Data collection with farmers began in the southern region in March 2014, consecutively in the west, ending in July 2015. The presentation of the researchers to the participants was carried out by the EMATER worker. The study sample had 331 farmworkers who met these criteria and agreed to research submitting the proposal.

For data collection called phase 1, QUAN, we used a form with discrete (example: age) and continuous (example: income) quantitative variables referring to the participant's identification data and the number of health problems by human organism system present from 2013 to 2015. With the qualitative/categorical variables, nominal (example: marital status, type of injury, a product of negotiation, participants) and ordinal (example: education level) referring to the complementation of identification data, type of health problems per system of the human organism in the aforementioned period and the frequency of seeking health care.

For the analysis of the set of variables, we used the Statistical Package for the Social Sciences software (version 21.0, SPSS, Inc., Chicago, IL, USA). We applied descriptive statistics whose data were presented by absolute and relative frequency and dispersion (mean and standard deviation). We used Pearson's chi-square test, with a level of statistical significance  $p \geq 0.05$  for inferential analysis.<sup>18</sup>

In phase 2, QUAL, an audio-recorded semi-structured interview was conducted based on a previously prepared script. There was a loss of 126 participants, having a sample of 205 farm workers who maintained their interest in participating and consented to audio recording and access to the interior of their home. The interviews took place at the end of completing the phase 1 form, usually in the living room or kitchen at home, without the presence of other adult family members.

The interviews lasted from 33 to 67 minutes. They were digitalized and organized in a database in text format. For this study, the following question was selected from the research script: how does negotiation at work improve farmers' health? Give an example. The answers were transformed into a single textual corpus, according to previous guidelines of the analysis software *Interface de R pour les Multidimensional Analyzes de Textes et de Questionnaires* (Iramuteq). As shown in Chart 1, they were coded in which the first number represents the participant's number; the second, the research region; and the third, the gender of the participant.

**Chart 1** - Codes used in the IRAMUTEQ software.

<b>Participant</b>	<b>Region</b>	<b>Unit</b>
From *n_01 to *n_205	*region_1: Southern of RS *region_2: Western of RS	*unit_1: Female *unit_2: Male

For the analysis of the textual corpus, we applied the Descending Hierarchical Classification (DHC) and the word cloud analysis. The DHC allows the identification of the number of words, the average frequency, and the number of hapaxes (words with frequency one), resulting in a dendrogram. The word cloud uses the frequency of occurrence of words to the group and organizes them graphically.<sup>19</sup>

The data analyzed come from the research project entitled: “Human nature of the male and female workforce: a study with workers in two rural environments in the Rio Grande do Sul”, approved in March 2013 by the Ethics Committee in Research, protocol n<sup>o</sup>: 23116.000645/2013-73. They are in line with the guidelines and regulatory standards of Resolution 466/2012 of the National Health Council/MS on Research Involving Human Beings. The anonymity of the participants and the possibility of leaving their consent or requesting clarifications about the research was communicated and the participant's Free and Informed Consent Form were signed previously at the beginning of data collection, in two copies. To maintain this anonymity, when presenting the results of this study, we used the coding of Chart 1.

## Results

The sample in the QUAN phase included farmers with an average age of 50.58 years old (SD ± 13.97) and an average monthly family income of R\$ 1,827.97 (SD ± R\$ 2,181.25). In the southern region of RS, 201 (60.7%) farmers participated, and most were female (n = 122; 60.7%).

In the western region, the male gender predominated (n = 74; 56.2%) among the 130 (39.3%) participants. Table 1 shows more data identifying the participants.

**Table 1** – Identification data of farmworkers (n=331) – RS, 2015.

<b>Variables</b>	<b>Categorization</b>	<b>Frequency</b>	<b>%</b>
<b>Region</b>	Southern	201	60.7
	Western	130	39.3
<b>Gender</b>	Female	182	55.0
	Male	149	45.0
<b>Skin color</b>	White	304	91.8
	Black	8	2.4
	Brown	18	5.4
<b>Marital status</b>	Indigenous	1	0.3
	Married	273	82.5
	Single	36	10.9
	Widowers	11	3.3
	Separated	11	3.3
<b>Education level</b>	Not literate	23	6.9
	Incomplete elementary school	220	66.5
	Complete elementary school	32	9.7
	Incomplete high school	19	5.7
	Complete high school	25	7.6
	Technical course	4	1.2
	Incomplete higher education	5	1.5
	Complete higher education	2	0.6
Complete post-graduation	1	0.3	

The annual demand for health services was very frequent among workers in both regions, with a greater reference for women farmers. At the same time, there is a higher proportion of workers in the western region than in the southern region, who do not seek health services (n = 31; 23.8%). Table 2 shows more data.

**Table 2** – Farmers' demand for health services – RS, 2015.

<b>Variables</b>	<b>Southern</b>		<b>Western</b>		<b>Female</b>		<b>Male</b>	
	<b>N</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>
	<b>(201)</b>		<b>(130)</b>		<b>(182)</b>		<b>(149)</b>	
Do not seek service	15	7.5	31	23.8	12	6.6	34	22.8
Bimonthly	17	8.4	5	3.8	12	6.6	10	6.7
Semiannually	33	16.4	11	8.5	40	22.0	4	2.7



Annually	62	30.8	45	34.6	60	33.0	47	31.5
Biannually	12	6.0	14	10.8	12	6.6	14	9.4
Triennial	5	2.5	3	2.3	6	3.3	2	1.3
Other	57	28.4	21	16.2	40	21.9	38	25.6

Signs and symptoms of illness in the last year were self-reported by 255 (77.0%) farmers.

Table 3 shows the main systems of the affected human organism.

**Table 3** – Systems with signs and symptoms manifested by farmers – RS, 2015.

Systems	Southern		Western		p*	Female		Male		p*
	n	%	n	%		n	%	n	%	
	(201)		(130)			(182)		(149)		
Articular	65	32.3	55	42.3	0.065	73	40.1	47	31.5	0.107
Nervous	11	5.5	9	6.9	0.589	10	5.5	10	6.7	0.644
Cardiovascular	14	7.0	9	6.9	0.988	14	7.7	9	6.0	0.556
Digestive	14	7.0	6	4.6	0.381	11	6.0	9	6.0	0.999
Respiratory	15	7.5	4	3.1	0.094	12	6.6	7	4.7	0.461
Integumentary	<b>12</b>	<b>6.0</b>	<b>1</b>	<b>0.8</b>	<b>0.017</b>	6	3.3	7	4.7	0.514
Urinary	8	4.0	4	3.1	0.668	<b>10</b>	<b>5.5</b>	<b>2</b>	<b>1.3</b>	<b>0.044</b>
Muscular	13	6.0	4	3.1	0.172	<b>14</b>	<b>7.7</b>	<b>3</b>	<b>2.0</b>	<b>0.020</b>
Skeletal	3	1.5	1	0.8	0.556	4	2.2	00	0.0	0.069
Endocrine	3	1.5	2	1.5	0.973	<b>5</b>	<b>2.7</b>	<b>0</b>	<b>0.0</b>	<b>0.041</b>
Genital	1	0.5	0	0.0	0.421	1	0.5	0	0.0	0.365
Lymphatic	1	0.5	0	0.0	0.421	1	0.5	0	0.0	0.365

\* Pearson's chi-square test with statistical significance level  $p \geq 0.05$

Most farmers in the southern and western regions showed symptoms in the articular system more frequently (32.3% and 42.3%, respectively). In the statistical test, the symptoms associated with the cutaneous system showed statistical significance, which confirms the hypothesis that rural work in agriculture can cause skin lesions. Nine of the 13 farmers indicate they manifested lesions with changes in skin color; two with the liquid collection and two with solid formation.

In the analysis by gender, the signs and symptoms with statistical significance are associated, respectively, with the muscular, endocrine, and urinary systems. In the muscular system, 17 farmers showed the symptoms but more frequently present among women farmers, stating pain in ligaments and infection of tendons and fasciae of the muscles of the upper and

lower limbs. Men reported muscle contraction (cramps) of the lower limbs. For the endocrine system, five farmers showed irregularities in the menstrual cycle. For the urinary system, 12 farmers manifested them, in which pain, discomfort, and burning during urination were present in females and reduced jet and flow obstruction in males.

Regarding the negotiated products, 259 (78.2%) workers highlighted seeds, 245 (74%) fertilizers, and 218 (65.8%) the supply of products. The traders (n = 149; 45%) were the main consumers of agricultural production, followed by consumers (n = 116; 35%) and resellers, that is, people who negotiate products with farmers and buyers (n = 114; 34.4%).

The application of the DHC method in the QUAL phase (n = 205) had 5 distinct semantic classes. Class 1, corresponding to 17.1% of the corpus and demonstrated with whom the negotiation in agricultural work occurs. In the southern region, the female farmers reported negotiating directly with resellers (n = 60) and with direct consumers (family members and neighbors, for example) (n = 87), while men farmers only with resellers. Both indicated it as beneficial to the increase in profit because it allows for longer working hours in cultivating and harvesting production. At the same time, they revealed the relationship with damage to the health of workers who feel pain and are exposed to occupational, physical, and ergonomic risks.

*I negotiate because my production does not commit the supermarket, [...] to anyone [...], when I take 500 feet of lettuce to the fruit and vegetable shop, it sells well, I return home full to work, even though I feel back pain [...]. (n\_121; region\_1; unit\_1)*

*[...] The improvement of agricultural work is to do it with it [reseller] [...] I give, she takes and sells. This has changed, improved because I don't have to worry about picking up my plants and taking them to sell [...] I just deliver them and I can work for longer in the fields, even though I know I'm exposed to the sun [...]. (n\_91; region\_2; unit\_2)*

Class 2 corresponds to 26.4% of the corpus and is directly associated with class 3. The first reveals who carries out the negotiation and the second points to its objectives. In both

regions, the negotiation takes place by the family members, especially the spouses. This allows the cultivation to be adapted to the requirements and needs of consumers/resellers, in which there is a reduction in chemical risks resulting from the use of pesticides.

*My husband and I negotiate everything, how much we are going to sell, if we are going to do promotion [...] it is a family negotiation [...] on the day of the promotion, consumption increases much more, all my work changes, I work more [...] not for my health. (n\_130; region\_1; unit\_1)*

*Because our agriculture is familiar, it has to be ourselves to do it, there would be no way for a third person to do it, we know what we produce, we have control over what we produce, what we are going to sell. This negotiation has changed, we are making a contract with the market [...] if we need to increase our production [...] plant some other product or if we have to take out any product [...]. That is the negotiation aimed at health, the little we do is to use fewer pesticides in the plantation. (n\_259; region\_2; unit\_2)*

Class 3 corresponds to 14.7% of the corpus and is directly associated with class 2. It shows the purpose of farmers during the negotiation of agricultural production. They are not concerned directly with their health, but with their survival and profit. From this, there is a reduction of physical efforts applied to the production process due to the acquisition of equipment.

*I am the one who negotiates the family's interests to buy, sell and the goal is to survive here. Changes only to profits, benefits, I buy something to work. There is no one [farmer] who thinks about worker health. (n\_129; region\_1, unit\_2)*

*My brother and I negotiated to sell, we get a better result, a better price. Change is that the guy [farmer] becomes more responsible, more careful to negotiate and make a better profit. In health, the guy [farmer] seeks to sell something better, to have a better price, to have more money to buy equipment, to improve, to decrease physical effort [...]. Generally, the guy [farmer] doesn't see his health, he sees the profit, which [...] comes and will improve everything. (n\_294, region\_2, unit\_2)*

Class 4 corresponds to 22% of the corpus and is directly associated with class 1. There is an identification of what is negotiated and how the sale of agricultural products promotes the health of workers. For some workers, the profit from the negotiation of products becomes important because it can afford to treat comorbidities associated with agricultural work.

*[...] The negotiation aimed at the worker's health occurs by selling goods, such as onions and tomatoes to have the money to maintain health [...].* (n\_111; posic\_1; uni\_1)

*We have back pain. We struggle to earn money to be able to buy medicines to maintain health [...] we get them [medicines] at the health center [...] but they have very expensive medicines, sometimes they don't give us and we have to buy them.* (n\_309; region\_2; unit\_1)

Class 5 corresponds to 19.9% of the corpus and is directly related to classes 2 and 3. It appears that some workers can perceive damage to health due to habits and customs, such as drinking alcoholic drinks. Also, the lack of knowledge of a possible relationship between the negotiation of agricultural work with health shows a certain lack of commitment with it due to the ease of access to health centers to which they resort to care only when they are sick.

*[...] There is no negotiation for the worker's health. There is none. No, because the health center is there to assist when farmers are sick [...].* (n\_12; region\_1, unit\_2)

*[...] You have to take care of yourself, work right, eat well, don't drink, don't be drunk because what spoils the farmer's health is the drink [...] even though I know all of this, I drink once while at work breaks.* (n\_245, region\_2, unit\_2)

We found that farmers negotiate to sell their products such as onion, beet, carrot, among others. They also buy the inputs needed to carry out and maintain planting. The negotiation is not identified by the farmers as beneficial to their health since it is carried out for the profit that



## Discussion

The results provide information on the health of farmworkers and suggest that the intensity of the fruit and vegetable production work exposes them to occupational risks and the negotiation of the products of this work enables the assistance to their health when they have diseases.

A Japanese study showed the same attitude of these workers in eastern countries, justified by aspects related to means of transportation and the geographical distance between the production environment and health care services.<sup>20</sup> Brazilian studies carried out with farmers in the extreme south of RS reveals that they feel satisfied with the type of work, with autonomy, and with the condition of supporting the family based on the results of the work. At the same time, they identify negative impacts from the lack of technical support for the cultivation and use of pesticides, causing damage to the environment and the health of workers in the region.<sup>21</sup>

Symptoms like skin and eye irritation, headache, and dizziness are present in 34% of 318 cotton growers in Punjab, Pakistan. Such symptoms indicate the high level of exposure of workers to chemical risks, for example, the use of pesticides, which are common by farmers. This generates a low demand for health services or even professional care.<sup>22</sup>

Insufficient information and knowledge about health and safety, especially for the use of personal protective equipment by rural workers, was associated with their low level of education. This is also a causal factor for the intoxications of male farmers, in the Brazilian state of Minas Gerais.<sup>23</sup> We believe that it may also be contributing to minimizing the negotiation regarding the production of benefits for the improvement of farmers' health since there is the presence with statistical significance of cutaneous, muscular, and urinary signs and symptoms, and yet the annual search for health services by the participants of this study predominates.

The lesions with changes in skin color computed in the QUAN phase are elucidated in classes 1 and 3 of the DHC and the word cloud. The female activities of selling agricultural

products in horticulture and male activities of cultivation of the land are carried out in environments with exposure to natural ultraviolet radiation. This makes a higher probability of cutaneous lesions in the region of the face of rural workers, who when compared to other non-rural people are in a significantly younger age group.<sup>6</sup> A study carried out in Scotland with a rural population diagnosed with melanoma revealed that treatment with excision of the skin lesion occurs predominantly in primary care, indicating the access of this population to health services and strengthening the presence of changes in the integumentary system for such search for health services.<sup>24</sup>

In the Brazilian context, access to primary care by farmers focuses on the free purchase of analgesic and antipyretic drugs and medical referrals for examinations by specialists. This situation is a justification used by agricultural workers, especially men, for access only in the presence of signs and or symptoms of illness, the report of its invisibility by health professionals, and the long distances to be covered from home to services. In addition to requiring financial resources for commuting, sometimes there is the loss of hours of work and, consequently, productivity.<sup>25</sup>

Such data contribute to the delay in diagnosis and early treatment of diseases in the rural population. Also, there are high rates of underreporting of illnesses as identified in the Brazilian study on skin cancer notifications across the country. It was carried out from 2007 to 2012 and identified 269 cases, of which 92% occurred in rural workers, pointing out incompleteness in filling out the notifications that promoted an underestimation of these data.<sup>26</sup>

Agricultural production and its sale require the farmer worker many hours in movement or an upright position. This is a fact that may have contributed to the manifestation of back pain in the upper and lower limbs. A study carried out in Vale do Ribeira, state of São Paulo, identified the presence of musculoskeletal disorders in these workers. The regions most affected were the lower back, shoulders, and knees, which caused the highest rates of

absenteeism in the last year among workers in that location.<sup>16</sup> Another study carried out in the Midwest region of the United States revealed that pain in the upper limbs has caused the absenteeism of farmers in approximately 2.6 days in two weeks.<sup>27</sup>

However, the negotiation of agricultural products interferes positively with the health of rural workers. This is because it allows investment in new technologies that promote a reduction in physical efforts applied to the work process. This evidence is demonstrated in Asian research, which confirms this finding as it reveals health as a synonym for work, for production, to remain on the land plot conquered, making it technologically productive.<sup>28</sup> In Finland, investing in modernization of the means of production can have positive effects, both on the quality and quantity of labor, and on the safety and health of the agricultural worker. This is because it results in improvements in chronic musculoskeletal conditions, which are associated with repetitive physical effort, the positions adopted during the work process, and strenuous working hours.<sup>29</sup>

Regarding alcoholism, agricultural workers in this study perceive addiction as a habit that can compromise their health. An Australian study corroborates this finding as it reveals the tendency of farmers to have their physical and mental health compromised, based on the use of large quantities of alcoholic beverages to heal, mainly, social isolation.<sup>30</sup> Despite the identification of health damage resulting from unsafe habits and behaviors, farmers' lack of commitment is expressed in the search for health services only in the presence of health problems and/or illness. Different international studies point to similar results, emphasizing that rural workers when facing common health problems prefer to solve them alone.<sup>7,29-30</sup> Such personal and cultural values of the agricultural population and the lack of concern for health become contributing factors to the difficulty in accessing health services and increasing rates of preventable injuries and illnesses resulting from their work process.<sup>27</sup>



We believe that the non-questioning about the presence of occupational risks to agricultural workers may represent a limitation of this research. However, the perspective adopted by the authors aimed to understand not only the study participants' ability to recognize them but to reflect on the possibilities of minimizing them when they buy and sell products for and from the cultivation of the land.

## **Conclusion**

The data revealed that farmers perceive changes in the intensity of exposure to occupational risks from the negotiation of agricultural products. This allows them to extend their working hours in planting and cultivation and consequently their direct exposure to the ultraviolet radiation emitted by the sun, considered a physical risk. On the other hand, it allows them to modernize the work environment and reduce efforts applied to the work process, which is an ergonomic risk. Therefore, rural workers recognize the reduction in the use of pesticides in their plantations as a positive effect of the negotiation. They also realize that this reduction has an impact not only on their health but on the people, who buy their agricultural products and on environmental health. This is because the information from contact with resellers and consumers indicates to farmers that such a reduction makes products more attractive for marketing.

Such changes in the intensity of exposure of agricultural workers to occupational risks increase the profit from the rural work process. For some farmers, this represents the possibility of improving and/or recovering their health since it allows them to pay for medicines, private medical consultations and to sign health insurance for the treatment of already established diseases.

Therefore, we believe that this study contributes to Nursing by identifying weaknesses in the knowledge of rural workers on the relationship between occupational risks and the negotiation of their work products, from the actions aimed at health promotion, such as the self-care guidelines on surveillance in the use of personal protective equipment, the monitoring

of clinical health conditions and the frequency of access to health care services, among others. This may allow rural workers to become able to recognize risky behaviors in their work process and the negotiation of their products and can change them to improve their health conditions. From this perspective, rural workers become active subjects in health care.

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**Scientific Editor:** Tânia Solange Bosi de Souza Magnago

**Associate Editor:** José Luís Guedes dos Santos

**Funding/Acknowledgment:** We thank the Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPq for funding the research project entitled “Human Nature of the Male and Female Workforce: a study with workers in two rural environments in Rio Grande do Sul”. Call MCTI/CNPq/SPM-PR/MDA n°32/2012 – Process n°. 405285/2012-4.

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### **How to cite this article**

Cardoso LS, Bonow CA, Xavier DM, Cezar-Vaz MR. Occupational risks in agricultural work and the negotiation for the health of rural workers. Rev. Enferm. UFSM. 2021 [Access on: Year Month Day]; vol.11 e43: 1-21. DOI: <https://doi.org/10.5902/2179769248096>