

Work and health conditions of women rural workers: an integrative review

Condições de trabalho e saúde de trabalhadoras rurais: uma revisão integrativa

Lucimara Beserra¹, Élide Azevedo Hennington¹, Marta Gislene Pignatti²

DOI: 10.1590/0103-11042023137211

ABSTRACT Changes in the global rural workforce took place from 1980 onwards, above all, with the increase in female participation in salaried work. An integrative review of the literature on the working and health conditions of rural women workers, published from 2010 to 2020, was carried out. The databases consulted were BVS, SciELO and PubMed, and 43 studies, 11 national and 32 internationals, were analyzed. The results point to a diversity of work activities performed by rural women, in a salaried, autonomous and cooperative way, as well as unpaid activities. Working conditions in salaried jobs are generally precarious, with temporary contracts, low wages and long working hours. In autonomous work and in cooperatives, studies report greater control of activities, financial autonomy and greater satisfaction of workers. Stood out in all forms of work, the sexual division of labor and the work overload with the addition of productive activities, unpaid reproductive activities, housework and care work. Musculoskeletal disorders, suffering and mental illness, high exposure and poisoning to pesticides and violence in the work and domestic environment were identified as preponderant in the health-work relationships experienced by these rural women workers.

KEYWORDS Women, working. Rural workers. Working conditions. Rural health.

RESUMO As mudanças na força de trabalho rural mundial ocorreram, a partir de 1980, sobretudo, com o aumento da participação feminina no trabalho assalariado. Foi realizada uma revisão integrativa da literatura publicada entre os anos de 2010 a 2020 a respeito das condições de trabalho e saúde de trabalhadoras rurais. As bases de dados consultadas foram BVS, SciELO e PubMed, e 43 estudos, 11 nacionais e 32 internacionais, foram analisados. Os resultados apontam uma diversidade de atividades de trabalho exercidas por mulheres rurais, de forma assalariada, autônoma e em cooperativas, bem como atividades não remuneradas. As condições de trabalho em empregos assalariados, em geral, são precarizadas, com contratos temporários, baixos salários e longas jornadas de trabalho. No trabalho autônomo e em cooperativas, os estudos relatam maior controle das atividades, autonomia financeira e maior satisfação das trabalhadoras. Destacou-se, em todas as formas de trabalho, a divisão sexual e a sobrecarga de trabalho com o acréscimo às atividades produtivas, das atividades reprodutivas não remuneradas, serviço doméstico e de cuidado. Distúrbios osteomusculares, sofrimentos e adoecimentos mentais, alta exposição e intoxicações por agrotóxicos e a violência no ambiente de trabalho e doméstico foram identificados como preponderantes nas relações saúde-trabalho vivenciadas por essas trabalhadoras rurais.

PALAVRAS-CHAVE Mulheres trabalhadoras. Trabalhadoras rurais. Condições de trabalho. Saúde da trabalhadora rural.

¹Fundação Oswaldo Cruz (Fiocruz), Escola Nacional de Saúde Pública Sergio Arouca (Ensp), Programa de Pós-graduação em Saúde Pública – Rio de Janeiro (RJ), Brasil.
lucimara.beserra@gmail.com

²Universidade Federal de Mato Grosso (UFMT), Instituto de Saúde Coletiva (ISC) – Cuiabá (MT), Brasil.



Introduction

Work is a human activity that permeates life in society, playing an important role in mediating relations between subjects and collectivities, between the microscopic and macroscopic levels of life^{1,2}. As a human activity, work is not restricted to a formal employment relationship or paid productive activities, it also turns to unpaid work activities and social reproduction, such as domestic work^{3,4}.

Women's work activities in the field are essential for food production, animal husbandry and social reproduction. It is women rural workers who produce a large part of subsistence agriculture (especially in the regions of Africa, Asia and the Americas), in addition to carrying out most of the domestic work and care for children and the elderly⁵.

Data from the Food and Agriculture Organization of the United Nations (FAO)⁶ and the International Labor Organization (ILO)⁷ point out that women represent more than 40% of the workforce in the rural economy in the world, and may exceed 50% in poor countries and the global South. However, the participation of women's workforce in the countryside is underestimated and made invisible in the statistics, considering that it is women who develop agriculture and animal husbandry around the house – subsistence activities considered part of the domestic work and not productive activities in the capitalist economy⁵.

The invisibility of women's work in the countryside is favored by the patriarchal structure of social and power relations in which the sexual division of labor predominates. Women's work is treated as complementary in rural paid productive activities and unpaid work, on the contrary, is considered a female task, in which men offer complementary work force⁸.

With capitalist productive restructuring and neoliberalism, from the 1980s onwards, new scenarios developed in globalized agricultural activities, in which women began to

have greater participation in the paid rural workforce, as well as an increase in the rates of female self-employed rural workers and heads of household. This trend in waged rural work is called the feminization of agriculture, mainly in South America and Africa^{9,10}. Lastarria-Cornhiel⁹, in a review of the literature on the subject, in 2008, observed precarious living and working conditions for women rural workers in these new jobs, in addition to lower wages compared to men.

Faced with a scenario of historical inequalities between male and female, urban and rural work, as well as the relationship between the work process and the health-disease process of individuals and populations, knowledge and visibility of the working and health conditions of woman rural workers become essential in the elaboration of public policies for health, work and the reduction of gender inequalities in rural areas.

Thus, the objective of the study is to know the working and health conditions of women rural workers from an integrative review of the literature published on the subject between January 2010 and December 2020.

Methodology

This study consists of an integrative literature review on the work and health of women rural workers. The integrative review combines empirical and theoretical literature and several study methodologies, allowing a broad approach and the incorporation of multiple objectives (defining concepts, reviewing theories, reviewing evidence, etc.). Starting from a question/problem and pre-established criteria, the literature search, data collection and critical analysis are fundamental steps in the integrative review¹¹⁻¹³.

The question/problem of this review is the working and health conditions of women rural workers and the inclusion criteria established for the articles were: discussing the work activities of rural women and the relationships

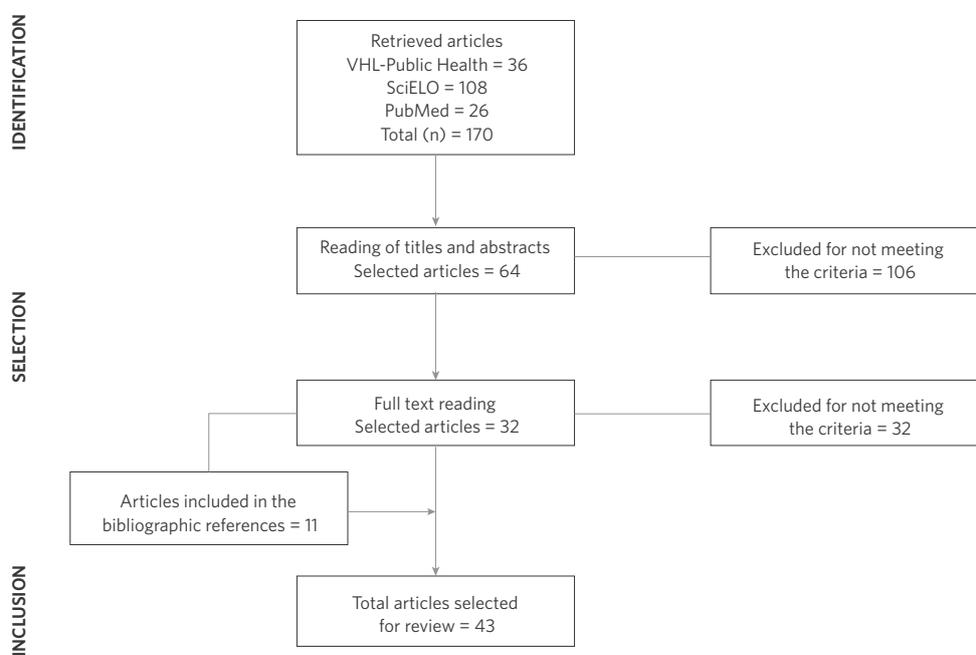
with the workers' health; open access publications; availability of full text in Portuguese, English or Spanish. Exclusion criteria were: restricted access publications; publications in other languages; publications that did not address the research problem in question.

The bibliographic search was carried out in the databases of the Virtual Health Library (VHL) – Public Health, Scientific Electronic Library Online (SciELO) and PubMed, in January 2021, using the descriptors in English: working conditions, rural health, agricultural workers' diseases, rural workers, rural women, and women, working. The search strategies, combining descriptors and Boolean operators, used in each database were: VHL-Public Health – ((Rural Health) OR (Agricultural Workers' Diseases) OR (rural workers) AND (“women, working”)); SciELO – ((“Rural Health”) OR (“Agricultural Workers' Diseases”) OR (“Working Conditions”) AND (“Rural Women”)); PubMed – (“Rural health”

OR “Agricultural Workers' Diseases” OR “Rural Workers” AND “Women, Working”).

In total, 170 articles published between 2010 and 2020 were retrieved. After reading the titles and abstracts, 64 articles were selected for full text analysis. After reading the articles, 32 were selected for review. Complementarily, 11 bibliographical references of articles previously selected in the integrative review were included in the results. The 11 articles, although not detected through the search descriptors, met the rest of the inclusion criteria: publications in the period from 2010 to 2020, open access, in Portuguese, English or Spanish, addressing the theme of rural women's work and women workers' health. The 11 publications identified and added from the analysis of the references of the 32 articles in the review made it possible to broaden the scope of the discussion, especially as they contemplate different countries and regions.

Figure 1. Selection process of studies included in the review



Source: Own elaboration, 2022.

To organize the retrieved references, the Zotero reference manager software was used. In extracting information from the articles, including the general characteristics of each study (authors, year, type of study, place of study, etc.), as well as information about the work and health of women rural workers, an Excel spreadsheet was used.

Results and discussion

Forty-three articles were selected and analyzed, representing a variety of national and international research carried out on the work and health of women rural workers (*table 1*). Such studies were carried out in 14 countries, with a predominance of articles from the Americas (86% of the studies). Brazil was the country with the most studies analyzed (11). Regarding the type of study, the qualitative approach (including case studies, oral history, documentary research, essays and ethnographies) was found in 21 articles (49%), followed by epidemiological studies (descriptive and cross-sectional) in 10 articles (23%), seven studies with mixed quantitative-qualitative methods (16%), four articles (9%) with

quantitative approaches (demographic and statistical studies) and one literature review.

The studies showed differences in relation to the territorial scope of the research, since rural areas, depending on the country or region, have different characteristics in relation to the organization of properties, type of natural landscape, productive activities developed, among others. In *table 1*, the spatial scope of the publications was organized from the description of the study sites, as follows: a) agroindustry – specific location; b) rural community – areas of settlements and small properties with varied production activities; c) rural region – areas encompassing farms, agroindustries and rural communities of settlements and small farmers, with predominance of specific productive activity or varied activities; d) country – covers data from the national territory.

From this organization, it was found that most studies (24 articles) addressed rural regions, generally with a predominant production sector, such as fruit and horticulture. Studies in rural communities were observed in 11 articles; in agroindustries there were three and with nationwide data there were five articles (*table 1*).

Table 1. Articles included in the review according to country, study approach, authors/year and territorial scope of the study

Country	Study type/approach	Authors/Year	Scope of study
South Africa	Epidemiological	Naidoo et al., 2011 ¹⁴	Rural communities
		Motsoeneng e Dalvie, 2015 ¹⁵	Rural Region – Fruit growing
Argentina	Qualitative	Mingo, 2011 ¹⁶	Rural region – fruit growing and horticulture
		Bocero e Di Bona, 2012 ¹⁷	Rural Region
		Perona, 2012 ¹⁸	Rural Region
Australia	Quanti-quali	Innes et al., 2010 ¹⁹	Rural Region – horticulture
Brazil	Quanti-quali	Costa et al., 2014 ²⁰	Rural communities
	Epidemiological	Motta et al., 2010 ²¹	Rural Communities
		Cezar-Vaz et al., 2015 ²²	Rural region – horticultural
		Cezar-Vaz et al., 2015 ²³	Rural region – horticultural
	Qualitative	Graf e Coutinho, 2010 ²⁴	Meat agroindustry
	Cavalcanti et al., 2012 ²⁵	Rural regions – fruit growing	
	Mendes et al., 2014 ²⁶	Rural communities	

Table 1. Articles included in the review according to country, study approach, authors/year and territorial scope of the study

Country	Study type/approach	Authors/Year	Scope of study
Brazil	Qualitative	Oliveira e Nina, 2014 ²⁷	Rural communities
		Wesz Junior, 2015 ²⁸	Rural communities
		Rocha e Rigotto, 2017 ²⁹	Fruit agroindustry
		Siqueira et al., 2017 ³⁰	Rural region - fruit growing
Chile	Quanti-quali	Fawaz-Yissi e Soto Villagran, 2012 ³¹ Fawaz-Yissi e Rodríguez Garcés, 2013 ³²	Rural region
	Quantitative	Rodríguez Garcés e Munoz Soto, 2015 ³³	Country
	Qualitative	Caro Molina, 2017 ³⁴ Valdés S. et al., 2017 ³⁵	Rural region - fruit growing Country
Colombia	Qualitative	Giraldo, 2010 ³⁶	Rural communities
		Becerra et al., 2013 ³⁷	Rural region - fruit growing
		Suárez et al., 2018 ³⁸	Rural communities
Cuba	Qualitative	Campos-Gómez, et al., 2018 ³⁹	Rural region
Ecuador	Qualitative	Mantilla, 2015 ⁴⁰	Rural region
USA	Epidemiological	Arcury et al., 2015 ⁴¹	Rural region
		Pulgar et al., 2016 ⁴²	
		Arcury et al., 2018 ⁴³	
	Qualitative	Murphy et al., 2015 ⁴⁴	Rural region
		Kim et al., 2016 ⁴⁵	
Mexico	Quanti-quali	Ruiz Meza, 2013 ⁴⁶	Rural communities
	Quantitative	Garay-Villegas, 2012 ⁴⁷	Country
	Qualitative	Ledesma, 2010 ⁴⁸ Guzmán Gómez, 2014 ⁴⁹	Tomato agroindustry Rural region
Paraguay	Quanti-quali	Borja e Díaz, 2010 ⁵⁰	Rural communities
Poland	Epidemiological	Bojar et al., 2011 ⁵¹	Rural region
		Rackiewicz et al., 2019 ⁵²	
Turkey	Quantitative	Davran, et al., 2019 ⁵³	Rural communities
Uruguay	Quanti-quali	Mascheroni e Riella, 2016 ⁵⁴	Rural region
	Quantitative	Vitelli e Borrás, 2016 ⁵⁵	Country
	Review	Chiappe, 2020 ⁵⁶	

Source: Own elaboration, 2022.

Three main forms of insertion of women in rural work were identified: salaried work – carried out on third-party farms and agroindustries; self-employment – activities carried out on their rural properties; cooperative work – carried out in women's or small farmers' cooperatives. In 25 studies, salaried work was

identified (58%), in 13 studies, autonomous work (30%) and in five, cooperative work (12%). The main characteristics and working conditions found in the studies are organized in *table 2*, according to the form of insertion in rural work.

Table 2. Forms of insertion in the work and main characteristics and conditions related to the work of rural women, in the period from 2010 to 2020

Insertion in the rural Work	Characteristics and working conditions	References
Salaried work	Temporary and flexible contracts; low pay; gender inequality	16,17,25,27,29,33-35,37,40,42,45,48,54
	Long working hours	29,35,41,48
	Lack of sanitary infrastructure; lack of Personal Protective Equipment (PPE)	29,34,37,48
	Work overload (productive and reproductive)	16,17,27,40
	Exposure to pesticides	15,22,27,29,35,37,45,48
	gender inequality	30,55
	Lack of labor and social security rights	34,41,54
	Sexual harassment	44,45
	Physical work overload; heavy load lifting	52
Social recognition of female work	32,33	
Self-employment	Work overload (productive and reproductive); gender inequality	20,23,24,39,50,53
	Repetitive movements; heavy load lifting	19,21
	Lack of social recognition of female work	18,46,53
	Exposure to pesticides	14,20,56
	High physical and time demand	23
	Increase in family income	24,31
Cooperative work	Harmonious and supportive environment	27,36
	Social recognition of female work	27,28,38
	female leadership	26-28,36,38
	Increase in family income	26,28
	Work overload (productive and reproductive)	27,38

Source: Own elaboration, 2022.

Salaried work, self-employment and the sexual division of labor

In relation to women's rural salaried work, the predominant characteristics were: temporary and flexible contracts, in addition to low remuneration; gender inequality in the division of labor; long hours of work; overload of productive and reproductive work; exposure to pesticides, in addition to the lack of labor and social security rights (*table 2*).

In Latin America, studies in Argentina^{16,17}, Brazil^{25,27,29}, Chile³³⁻³⁵, Colombia³⁷, Ecuador⁴⁰, Mexico⁴⁸ and Uruguay⁵⁴ show paid work by women mainly in the fruit growing sector (tomatoes, passion fruit, papaya, bananas, grapes,

peaches, among others) and horticulture (broccoli and vegetables in general), in which they are employed on temporary contracts, depending on the period of harvesting and planting of crops, without a fixed monthly income. Wages are low and often subject to daily production targets, working hours are long (between 8 and 16 hours), there is an overload of work for women in relation to productive activities and domestic work, and exposure to pesticides is frequent.

This scenario is in line with the development of agribusiness production chains in Latin America, in the midst of neoliberal globalization⁵⁷. The capitalist productive restructuring, starting from the crisis of the

1970s, in general, generated a change in the organization of production and work, moving from a more rigid, controlled model, centered on 'developed' countries (Fordism-Taylorism) for a more flexible, adaptable form of organization, capable of being transported to territories with more profitable labor and environmental conditions (toyotism)⁵⁸. Such conceptions were also incorporated into the global agricultural sector^{57,59}.

In the last three decades, in Latin America, there was the installation and development of several agroindustries to export from the South to the North^{10,57}, with intense incorporation and exploitation of women's work, in more precarious working conditions and with few labor rights, as observed in the studies reviewed in the regions of Vale do São Francisco (PE)²⁵ and Chapada do Apodi (CE)²⁹, in Brazil; in the Province of Cotopaxi⁴⁰, in Ecuador; in the Valle de Arista⁴⁸, in Mexico; in the commune of Putaendo³⁴, in Chile; and in the regions of General Pueyrredón (Mar del Plata)¹⁷ and Valle do Uco¹⁶, in Argentina.

In addition to the productive restructuring of agriculture, such working conditions are also based on the patriarchal, racist and colonialist societal logic that considers that women's work must prioritize the reproductive sphere of social life, and when inserted in the productive sphere, female work, mainly by black women and from countries in the global South, is less valued socially and monetarily^{8,60}.

In the United States of America (USA), there is a movement to incorporate the migrant rural workforce, especially Mexican and Central American women⁴¹⁻⁴⁵. Workers who, in a situation of social vulnerability⁶¹, with a lower horizon of expectations and in search of their own survival and that of their families, tend to accept more degrading and precarious working conditions.

In the studies by Kim et al.⁴⁵ and Murphy et al.⁴⁴, carried out with female migrant workers, in the rural area of Washington (Yakima Valley) and in the Willamette Valley

(Oregon) in the USA, female workers also report an insecure and intimidating environment, permeated by sexual harassment from supervisors and work colleagues, mostly men. Workers feel pressured to tolerate harassment due to their socioeconomic and legal conditions in the country.

Less predominantly, financial autonomy, as well as social recognition and personal development of women rural workers were characteristics linked to salaried work activities^{32,33,48}. In the study by Fawaz-Yissi and Rodríguez Garcés³², in the province of Ñuble in Chile, the results point to contradictions and changes in the traditional role of women in family farming, since there is an increase in the incorporation of women in the world of salaried rural work and they also develop other non-agricultural activities that complement the family income, generating greater levels of financial autonomy, access to new networks and social circles.

Still in Chile, Rodríguez Garcés and Muñoz Soto³³ observe the increase in female employment in rural areas, in the last 30 years in the country, with more precarious working conditions, temporary and flexible contracts and lower wages. However, they add that rural women, especially the younger and more educated ones, link their personal development, social recognition and family well-being to insertion in the world of work. Similar observations are made by Ledesma⁴⁸ in Mexico, where work in the tomato agroindustry, despite being temporary and precarious, enables greater financial autonomy and entry into other social spaces in the search for partners.

Such characteristics highlight the attribute of work as a human activity permeated by potential contradictions¹. According to Schwartz et al.², the work activity is the place of debate between the antecedent norms rooted in the social means of reproduction of life and the re-singularizations that invariably happen. At work, based on their values and worldview, women renormalize and re-singularize this activity in their lives.

With regard to self-employment, carried out on the family's own land, the main characteristics and working conditions of women were work overload and gender inequality in the division of activities, followed by the lack of social recognition of women's work, exposure to pesticides and high physical demands (*table 2*).

Studies carried out in rural communities in Brazil^{20,23,24}, Paraguay⁵⁰, Cuba³⁹ and Turkey⁵³ observe the overload of productive and reproductive work in women's routine, that is, the overload of agricultural activities (sowing, cultivation, harvesting, etc.) and animal husbandry (cattle, chicken, pigs, etc.), with domestic activities and childcare, since, due to the historical sexual division of labor between men and women, men tend to do less domestic and care work⁹.

The sexual division of labor, whether reverberating in the urban or rural sphere, has as its central characteristic the work activity of men being focused on the production pole and women on the pole of social reproduction. This division does not necessarily refer to the notion of complementarity and equality, since it is based on relations of exploitation-domination of gender, class and race, and has a hierarchical nature, in which male work has greater social value than female work⁸.

In studies on paid work by rural women, overload and the sexual division of labor were also present, both in agroindustry and agriculture, and in activities carried out within the domestic environment. According to Lastarria-Cornhiel⁹, in Latin America and Africa, in salaried work in the field and in production processing, there is a strong separation of activities according to gender. Women develop handicrafts that require greater attention, care and delicacy – characteristics considered female 'natural skills' – and, most of the time, it is considered unskilled work. On the other hand, male work requires greater physical strength and sometimes the use of machinery, characterizing it as skilled work.

In the analyzed articles, the activity of sorting and packing fruits and vegetables in

agroindustries is preferably carried out by women in Mexico⁴⁸, Argentina¹⁷, Brazil^{25,29,30}, Chile³⁴, Ecuador⁴⁰ and USA⁴⁵. In agriculture, mainly fruit, women develop activities based on the so-called 'female manual characteristics' – pollination, sowing and harvesting –, as observed in studies in Argentina^{16,17}, Brazil^{25,27}, Chile³⁴, Colombia³⁷, Ecuador⁴⁰ and USA⁴⁵. In Uruguay, Mascheroni and Riella⁵⁴ point to the great employability of rural women in domestic work.

Another issue that crosses the lives of women rural workers is the lack of social recognition of their work as farmers and peasants, which is often related to the unequal division of power and work between men and women on rural properties, as well as in the legislation of their countries. In Mexico, in the region of Chiapas, for example, it was observed that women, despite having an important role in food production, have legal difficulties in having land in their name and being recognized as heads of families, also affecting their participation in the region's water use and irrigation management association⁴⁶.

In Argentina, Perona¹⁸ problematizes the gender perspective in the National Agricultural Census, which considers women as 'family members of the producer' and not as 'producers', making women's work in production (harvesting, sowing, marketing, etc.) invisible.

Cooperative work, organization and resistance

In contrast to salaried and self-employed work, in studies on cooperative work, whether in women-only or mixed (men and women) cooperatives, it was noticed that such activity is related to higher levels of social recognition of female work, female leadership, increase in family income and a harmonious and supportive work environment, however, the overload of reproductive and productive work persists (*table 2*).

The work activity developed in cooperatives was identified in studies carried out in

Brazil²⁶⁻²⁸ and Colombia^{36,38}. In cooperatives, in general, women carry out fruit processing activities into pulps, sweets and jams, produce cheeses and yogurts, raise small animals, produce handicrafts and organize community events, betting on the plurality of activities.

In the study carried out by Oliveira and Nina²⁷ in the Brazilian Amazon region, the activities developed by the group of women of the cooperative also represent an escape from the multiple domestic tasks and allow relaxation, friendship and freedom, favoring health and quality of life. Similarly, for Colombian workers in the Cundinamarca region, participation in cooperative agroindustries contributes to self-esteem, enables a change in the chores routine, with more family members taking charge of tasks, and increases the network and circle of interpersonal relationships³⁶. Giraldo³⁶, in addition, emphasizes the importance of women's cooperatives to face poverty in the Colombian rural population and the role that these structures play in tensioning the power relations imposed by patriarchal hegemony.

In general, women's groups in cooperatives are more than just working groups; they are political action groups, since the movement to create rural women's cooperatives also entails the need for women workers to have a space of autonomy and political organization in the face of economic and gender inequalities faced in the rural sphere. For Kergoat³, work is not only a space of domination, but also of solidarity, cooperation and socialization, being 'potentially at the center of resistance and struggles' in search of the transformation of social relations of exploitation and domination.

Furthermore, the struggle and political organization of rural workers in unions and national associations were also present. Valdés et al.³⁵ analyze the performance of the National

Association of Rural and Indigenous Women (Anamuri), in Chile, in view of the precariousness of salaried work and health conditions, highlighting some achievements such as the increase in formal employment, access to the health system by temporary workers, improvements in work environments and changes in the subcontracting system.

Cavalcanti et al.²⁵ show, in the region of fruit growing for export in the São Francisco Valley – Brazil, the organization, struggle and achievements of the rural workers' union, composed mostly of women (although gender inequalities persist). Among the achievements related to gender demands are the guarantee of day care in companies with more than 20 women, security and employment for pregnant women, the right to rest for breastfeeding, among others.

Women rural workers' health

The health conditions of rural workers were systematized into four main groups of issues and health problems: musculoskeletal disorders, pesticide poisoning, mental disorders and infectious diseases (*table 3*).

Musculoskeletal disorders and mental disorders were the most reported work-related health problems in the reviewed studies. Infectious diseases were reported only in a study carried out in South Africa, in which rural workers in the Umkhanyakude District region, in northern KwaZulu-Natal, had a history of malaria cases. In this case, the long working hours when applying pesticides, the lack of protective clothing against the malaria vector, the use of artificial irrigation in the cultivation of sugarcane, cotton and mangoes were pointed out as factors that may have contributed to the increase in the incidence of the disease¹⁴.

Table 3. Summary of the main issues and health problems related to the work of rural women, in the period from 2010 to 2020

Issues and Health Problems	Diseases, signs and symptoms	References
Musculoskeletal disorders	Pain in arms, hands and legs	19,27,29,34,48
	Lower back pain	19,21,27,29,34,40,52
	Osteoarthritis	34
	Tendonitis	35,40
	Herniated disc	40
Mental disorders	Stress	23,34,37,41,43,45,51
	Anxiety	20,23,29,43,44
	Depression	20,23,29,42
	Sleep disorder	23,29
	Panic disorder	23
Pesticide poisoning	Skin irritation	48
	Irritation in the throat, respiratory tract and eyes	29
	Gastric manifestations: epigastric pain, regurgitation, bloating, nausea, vomiting	22
	Neurotoxic symptoms	15
	Congenital malformation	35
Infectious diseases	Malaria	14

Source: Own elaboration, 2022.

Musculoskeletal disorders

Symptoms of low back pain and pain in the upper and lower limbs are present in virtually all studies that reported musculoskeletal discomfort on the part of female workers. Such symptoms were related to repetitive movements and postures^{21,35,48}, weight lifting⁵², long workdays³⁴ and inadequate equipment handling practices¹⁹, performed mainly in salaried and self-employed activities.

Motta et al.²¹, in a study with rural communities in Santa Catarina, point out that 93.3% of rural workers with an average age of 40 and 41 years have already suffered from low back pain during some period of their lives, which may be related to time working in the field, repetitive movements at work, age and weight

gain. Rocha and Rigotto²⁹ report complaints of Repetitive Strain Injuries (RSI) and Work-Related Musculoskeletal Disorders (WMSDs) by female workers in fruit agroindustries in Ceará, Brazil.

In Chile, in the Commune of Putaendo, Molina³⁴ describes that the main health problems of female workers are osteoarthritis and pain in the legs, back, hands and arms, resulting from activities such as harvesting and cracking nuts for more than 10 hours without a break. Moreover, in Chile, Valdés et al.³⁵ identified tendinitis related to repetitive movements performed by female workers.

Studies in Australia¹⁹, Poland⁵², Ecuador⁴⁰ and Mexico⁴⁸ also reinforce the complaints from rural women about pain in the lower back and lower and upper limbs when carrying

out their work in conditions of high physical demand, work overload and inadequate postures.

Mental disorders and violence

Stress, anxiety and depression were the most common morbidities related to work and mental health in rural women. Bojar et al.⁵¹ observed that Polish women who work in agriculture in the Lublin region, in relation to other groups of workers (clerks, seamstresses and workers in the pharmaceutical industry), present greater intensification of stress at work, which is related to workload, the lack of reward and the uncertainty of the daily tasks that must be accomplished. In the study by Becerra et al.³⁷, in Colombia, work stress reported by workers was mainly related to precarious working conditions, with lower wages and temporary contracts.

In Brazil, in a rural horticulture community, Cezar-Vaz et al.²³ point out that 61% of the women interviewed reported some type of work-related mental disorder, with generalized anxiety disorder being more prevalent, followed by an acute reaction to stress, sleep disturbances, depressive episodes and panic disorder. Women workers with mental disorders also reported higher levels of physical demand, working time, effort and frustration.

In the USA, migrant women rural workers from Mexico feel stressed due to work and family responsibilities, and the sexual harassment suffered at work culminated in increased physical and emotional stress⁴⁵. The workers also described lack of health insurance and little knowledge of how to access the health system as an obstacle to good health, in addition to language difficulties. Another study in the USA⁴², with Latino rural workers, points out that one third of the women interviewed have depressive symptoms, a value three times higher than the rate of depression in the USA female population. Women rural workers who had more symptoms of depression were experiencing economic difficulties and low food

security. Arcury et al.⁴³ identified that female Latino farm workers in the USA have higher stress and anxiety scores than unemployed Latino non-agricultural female workers.

Violence (sexual, physical, verbal and psychological) was also a relevant factor in the women workers' mental suffering, both in the formal salaried work environment and in the domestic environment – linked to the performance of autonomous remunerated or social reproduction activities. Violence is a social and historical problem, and violence against women is no different. It carries marks of domination-exploitation, oppression and cruelty in power relations historically constructed between men and women^{62,63}.

Kim et al.⁴⁵, in the USA, report that 75% of the Latino female rural workers interviewed have suffered or know someone who has suffered sexual harassment at work, mostly by supervisors and male co-workers. Just like Murphy et al.⁴⁴, in the Willamette Valley region, in Oregon, USA, they show that the majority of Latina workers in the region suffered some type of harassment at work. Harassment is identified by workers through verbal comments and unwanted physical contact, staring and feelings of discomfort. Such situations generated higher levels of stress, anxiety, anguish and insecurity for workers, also forcing women to be alert at work and develop ways of defending themselves, such as wearing looser clothes to cover the body and pretending to be married or homosexual (in case of single and heterosexual women).

Furthermore, Costa et al.²⁰ identified that 43% of women rural workers, living in a settlement region in Rio Grande do Norte – Brazil, showed signs of a common mental disorder, with depressive/anxious mood being the most cited symptom. Violence (domestic and sexual), as well as marriage, poverty, work overload were cited by women as the main factors related to mental suffering. And Siqueira et al.³⁰ observed that 78.8% of women rural workers in the region of Petrolina in Pernambuco – Brazil, had already suffered

some type of physical, verbal, sexual and/or psychological violence.

Pesticide exposure and poisoning

Exposure to pesticides in rural women's work activities was identified in research carried out in Argentina¹⁷, Brazil^{20,23,27,29}, Colombia³⁷, Chile³⁵, Ecuador⁴⁰, Uruguay⁵⁶, Mexico⁴⁸, USA⁴⁵ and South Africa^{14,15}, in salaried jobs or in own production activities. The workers are directly exposed to pesticides in the preparation of the syrup (a mixture of pesticides), in the handling and application of chemical products on agricultural crops and in the handling of fruits and vegetables on which pesticides have been sprayed. Furthermore, it is necessary to consider the environmental exposure of rural workers and the population to pesticides, since the spraying of these chemical products turns the air, water and rain in rural areas into contamination routes^{64,65}.

It is estimated that 385 million people fall ill every year as a result of pesticide poisoning⁶⁶. In this review, five studies were identified that report signs and symptoms of pesticide poisoning in rural workers. In the tomato agroindustry, in the region of San Luis Potosí, Mexico, workers who sort and pack tomatoes experience skin irritations and allergies due to contact with the chemicals used in production⁴⁸. In fruit agroindustries, in the region of Chapada do Apodi – Ceará, in Brazil, women feel irritation in the throat, eyes and respiratory tract due to the proximity and strong odor of chemical products²⁹.

Also in Brazil, workers in the fruit and vegetable sector in Rio Grande do Sul report a high prevalence of gastric manifestations (pain, regurgitation, nausea and vomiting) that were associated, among other factors, with the use of pesticides²². In South Africa, Motsoeneng and Dalvie¹⁵ identified a higher prevalence of neurotoxic symptoms in rural workers compared to women living in cities, and three symptoms in the applied questionnaire (problems with buttoning, reading and

taking notes) were significantly associated with the presence of three metabolites of pyrethroid insecticides in the urine. Valdés et al.³⁵ report complaints of pesticide poisoning and cases of malformations in the children of female workers exposed to these chemical products by the National Association of Rural Women in Chile.

Worldwide, about 4 million tons of pesticides are used annually⁶⁶. According to the FAO Pesticides Use Database⁶⁷, from 2010 to 2019, on average annually, around 2 million tons of pesticides were used or sold in Asia, 729 thousand in South America, 485 thousand in Europe, 482 thousand in North America, 99 thousand in Africa, 96 thousand in Central America and 60 thousand in Oceania. Regarding South America – one of the regions in which the studies in this review were concentrated –, 50.1% of pesticides were used in Brazil, 28.3% in Argentina, 6.7% in Colombia and 4% in Ecuador. In the case of North America, the USA was the country that most used pesticides in the period.

Intense exposure and acute and chronic poisoning by pesticides in rural workers are directly related to the current model of agricultural production, based on monoculture, with little or no diversity and rotation of agricultural crops, high mechanization and dependence on chemical products^{64,68}. Family and peasant farmers who try to escape the hegemonic logic of production, in the case of the use of pesticides, are increasingly trapped between large properties and the use of the 'technological package' (conventional or transgenic treated and patented seeds, fertilizers and pesticides), making it difficult to resist without public policies to encourage the reduction in the use of pesticides and organic and agroecological production.

Final considerations

The reviewed articles point to a diversity of work activities of rural women, formal paid,

autonomous or in cooperatives, as well as unpaid activities of food production for subsistence and domestic work and care. Working conditions in salaried positions, in general, are precarious, with temporary, flexible contracts, long working hours and low wages. Following the logic of the sexual division of labor, there is a predominance of women in activities in the agro-industrial sector considered more 'delicate' and manual, such as harvesting and packing fruits and vegetables and sowing and pollination of some crops.

Paid work activities carried out autonomously were characterized by work overload, high physical and repetitive demand and lack of social recognition of female work, however studies also report greater control of activities by women and the possibility of financial autonomy. In women's cooperatives, the social recognition of work, female leadership and the increase in family income were predominant in characterizing the work done by women. Together with the productive activities carried out, it was common to mention carrying out activities of social reproduction, such as housework and childcare, which is an important issue in terms of work overload.

In the workers' health-disease process, musculoskeletal disorders linked to rural physical work overload and domestic work, mental suffering and illness, high exposure and acute and chronic intoxication to pesticides and violence were identified as predominant processes and situations experienced by these women.

Contrasting this scenario of precarious working and health conditions, the organization of workers in unions and women's groups in cooperatives played an important role in the resistance and in the search for better working conditions, as well as reduction of inequalities, in the rural environment.

Regarding the limitations of the study, the use of only three databases (SciELO,

PubMed and VHL-Public Health) is pointed out, which can be expanded in new investigations. Furthermore, the reviewed studies predominantly discuss the context of female rural workers in the Americas, requiring further studies and search strategies in reviews that may encompass research on the particularities of female rural workers in Asia, Africa and Europe.

Finally, it is pointed out the importance of implementing and strengthening public policies aimed at improving working and health conditions in rural salaried positions, with the expansion and guarantee of labor and social security rights, in addition to public policies to encourage family farming and agroecology, with emphasis on the participation of women in rural production.

Acknowledgements

This publication was supported by the Deputy Directorate for Research and Innovation and the Public Health Post-Graduate Program at the Sergio Arouca National School of Public Health/Oswaldo Cruz Foundation (ENSP-FIOCRUZ).

Collaborators

Beserra L (0000-0002-5310-1986)* contributed to the design, analysis and interpretation of data, writing, critical review and final approval of the version to be published. Hennington EA (0000-0001-5280-8827)* contributed to the analysis of results, critical review and final approval of the version to be published. Pignatti MG (0000-0001-7942-3847)* contributed to the design, critical review and final approval of the version to be published. ■

*Orcid (Open Researcher and Contributor ID).

References

- Schwartz Y. *Atividade. Laboreal*. 2005 [acesso em 2021 ago 6]; 1(1):1-3. Disponível em: <http://journals.openedition.org/laboreal/14272>.
- Schwartz Y, Duc M, Durrive L. Trabalho e uso de si. In: Schwartz Y, Durrive L, organizadores. *Trabalho & ergologia: conversas sobre a atividade humana*. Niterói: EdUFF; 2007. p. 191-206.
- Kergoat D. O trabalho, um conceito central para os estudos de gênero? In: Maruani M, organizador. *Trabalho, logo existo: perspectivas feministas*. Rio de Janeiro: FGV Editora; 2019. p. 287-294.
- Schwartz Y. Circulações, dramáticas, eficácias da atividade industriosa. *Trab. Educ. Saúde*. 2004 [acesso em 2021 set 10]; 2(1):33-55. Disponível em: <https://doi.org/10.1590/S1981-77462004000100004>.
- Federici S. Mulheres, lutas por terra e globalização: uma perspectiva internacional. In: *O ponto zero da revolução: trabalho doméstico, reprodução e luta feminista*. São Paulo: Editora Elefante; 2019. p. 279-302.
- Food and Agriculture Organization of the United Nations. *Women in agriculture: closing the gender gap for development*. Rome: FAO; 2011. [acesso em 2022 mar 4]. Disponível em: <https://www.fao.org/3/i2050e/i2050e.pdf>.
- International Labour Organization. *Rural women at work: bridging the gaps*. Switzerland: ILO; 2018. [acesso em 2022 mar 4]. Disponível em: https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---ilo_aids/documents/publication/wcms_619691.pdf.
- Kergoat D. Divisão sexual do trabalho e relações sexuais de sexo. In: Hirata H, Laborie F, Doaré HL, et al, organizadores. *Dicionário crítico do feminismo*. São Paulo: Ed. UNESP; 2009. p. 67-75.
- Lastarria-Cornhiel S. Feminización de la agricultura en América Latina y África. *RIMISP-Centro Latinoamericano para el Desarrollo Rural*. 2008 [acesso em 2022 fev 5]; (11):1-26. Disponível em: https://rimisp.org/wp-content/files_mf/files_mf/1366830040DTR_No.11_Lastarria.pdf.
- Valdés Subercaseaux X. Feminización del empleo y trabajo precario en las agriculturas latinoamericanas globalizadas. *Cuad Antropol Soc*. 2015 [acesso em 2021 set 16]; (41):39-54. Disponível em: <https://www.redalyc.org/articulo.oa?id=180942587003>.
- Souza MT, Silva MD, Carvalho R. Revisão integrativa: o que é e como fazer. *Einstein (São Paulo)*. 2010 [acesso em 2021 jan 6]; 8(1):102-106. Disponível em: <https://doi.org/10.1590/S1679-45082010RW1134>.
- Roman AR, Friedlander MR. Revisão integrativa de pesquisa aplicada à enfermagem. *Cogitare Enferm*. 1998 [acesso em 2022 fev 7]; 3(2):109-112. Disponível em: <https://revistas.ufpr.br/cogitare/article/view/44358>.
- Whittemore R, Knafl K. The integrative review: updated methodology. *J Adv Nurs*. 2005 [acesso em 2021 jan 6]; 52(5):546-553. Disponível em: <https://doi.org/10.1111/j.1365-2648.2005.03621.x>.
- Naidoo S, London L, Burdorf A, et al. Occupational activities associated with a reported history of malaria among women working in small-scale agriculture in South Africa. *Am J Trop Med Hyg*. 2011 [acesso em 2021 jan 15]; 85(5):805-810. Disponível em: <https://pubmed.ncbi.nlm.nih.gov/22049030/>.
- Motsoeneng PM, Dalvie MA. Relationship between urinary pesticide residue levels and neurotoxic symptoms among women on farms in the Western Cape, South Africa. *Int J Env Res Public Health*. 2015 [acesso em 2021 fev 9]; 12(6):6281-6299. Disponível em: <https://www.mdpi.com/1660-4601/12/6/6281>.
- Mingo E. Género y trabajo: la participación laboral de las mujeres en la agricultura del Valle de Uco, Mendoza, Argentina. *Papeles Trab*. 2011 [acesso em 2021 set 16];

- 5(7):172-188. Disponível em: <http://revistasacademicas.unsam.edu.ar/index.php/papdetrab/article/view/216>.
17. Bocero SL, Di Bona A. El trabajo asalariado femenino en el cinturón frutihortícola marplatense. *Geograficando*. 2012 [acesso em 2021 ago 10]; 8(8):1-21. Disponível em: https://www.geograficando.fahce.unlp.edu.ar/article/view/GEOv08n08a04/pdf_5.
 18. Perona E. La transformación tecnológica del sector agropecuario en la provincia de Córdoba y sus repercusiones sobre la mujer y la familia rural: its effects on women and rural families. *Rev Estud Fem*. 2012 [acesso em 2021 mar 8]; 20(3):739-760. Disponível em: <https://doi.org/10.1590/S0104-026X2012000300008>.
 19. Innes E, Crowther A, Fonti F, et al. Women's Health at Work Program: musculoskeletal pain experienced by women of Chinese background working on market gardens in the Sydney Basin. *Work*. 2010 [acesso em 2021 jan 22]; 36(2):129-140. Disponível em: <https://content.iospress.com/articles/work/wor01015>.
 20. Costa MGSG, Dimenstein MDB, Leite JF. Condições de vida, gênero e saúde mental entre trabalhadoras rurais assentadas. *Estud. Psicol*. 2014 [acesso em 2019 abr 22]; 19(2):145-154. Disponível em: <https://www.redalyc.org/articulo.oa?id=26132115007>.
 21. Motta AF, Cardoso FL, Sacomori C, et al. Dor lombar auto-referida em mulheres trabalhadoras rurais de sete comunidades de Concórdia-SC. *Ter Man*. 2010 [acesso em 2021 mar 8]; 8(35):10-16. Disponível em: http://s3.amazonaws.com/host-client-assets/files/mtprehab/tm_2010_35.pdf.
 22. Cezar-Vaz MR, Bonow CA, Couto AM, et al. Prevalência de sinais e sintomas digestórios em trabalhadoras rurais e fatores associados. *Acta Paul Enferm*. 2015 [acesso em 2021 mar 8]; 28(5):460-466. Disponível em: <https://doi.org/10.1590/1982-0194201500077>.
 23. Cezar-Vaz MR, Bonow CA, Silva MRS. Mental and Physical Symptoms of Female Rural Workers: Relation between Household and Rural Work. *Int J Environ Res Public Health*. 2015 [acesso em 2021 jan 22]; 12(9):11037-11049. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4586660/>.
 24. Graf LP, Coutinho MC. Trajetórias de mulheres atuantes em pequenos abatedouros de animais. *Cad Psicol Soc Trab*. 2010 [acesso em 2021 mar 8]; 13(1):119-132. Disponível em: http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S1516-37172010000100010.
 25. Cavalcanti J, Rodrigues V, Andrade B. Mulheres e trabalho na agricultura de exportação: questões atuais. *Anthropológicas*. 2012 [acesso em 2021 jul 12]; 23(1):67-88. Disponível em: <https://periodicos.ufpe.br/revistas/revistaanthropologicas/article/view/23745>.
 26. Mendes MF, Silva Neves SMA, Neves RJ, et al. A organização das mulheres extrativistas na região Sudoeste mato-grossense, Brasil. *Rev Estud Fem*. 2014 [acesso em 2020 fev 21]; 22(1):71-89. Disponível em: <https://doi.org/10.1590/S0104-026X2014000100005>.
 27. Oliveira JA, Nina SFM. Ambiente e saúde da mulher trabalhadora: transformações numa comunidade da Amazônia brasileira. *Saúde soc*. 2014 [acesso em 2019 out 27]; (23):1162-1172. Disponível em: <https://doi.org/10.1590/S0104-12902014000400004>.
 28. Wesz Junior VJ. Estratégias de desenvolvimento e a expansão das capacidades em um grupo produtivo de mulheres rurais assentadas. *Interações*. 2015 [acesso em 2021 mar 8]; 16(2):395-406. Disponível em: <https://doi.org/10.1590/151870122015214>.
 29. Rocha MM, Rigotto RM. Produção de vulnerabilidades em saúde: o trabalho das mulheres em empresas agrícolas da Chapada do Apodi, Ceará. *Saúde debate*. 2017 [acesso em 2019 jun 19]; 41(2):63-79. Disponível em: <https://doi.org/10.1590/0103-11042017S206>.
 30. Siqueira VB, Oliveira LMSR, Siqueira MAS, et al. Rural workers: work relationships and perceptions on violent events. *J Nurs UFPE online*. 2017 [acesso em 2021 mar 8]; 11(4):1662-1666. Disponível em: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/15236/18010>.

31. Fawaz Yissi J, Soto Villagrán P. Mujer trabajo y familia: Tensiones, rupturas y continuidades en sectores rurales de Chile central. *Ventana Rev Estud Género*. 2012 [acceso em 2021 abr 7]; 4(35):218-254. Disponível em: https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1405-94362012000100009.
32. Fawaz-Yissi MJ, Rodríguez-Garcés C. Mujeres rurales y trabajo en Chile central. Actitudes, factores y significaciones. *Cuad. Desarro. Rural*. 2013 [acceso em 2021 abr 7]; 10(72):47-68. Disponível em: <http://www.scielo.org.co/pdf/cudr/v10n72/v10n72a04.pdf>.
33. Rodríguez-Garcés C, Muñoz Soto J. Participación laboral de las mujeres rurales chilenas: tendencias, perfiles y factores predictores. *Cuad Desarro Rural*. 2015 [acceso em 2021 mar 9]; 12(75):77-98. Disponível em: <http://dx.doi.org/10.11144/Javeriana.cdr12-75.plmc>.
34. Caro Molina P. Desigualdad y transgresión en mujeres rurales chilenas: Lecturas desde la interseccionalidad, género y feminismo. *Psicoperspectivas*. 2017 [acceso em 2021 mar 10]; 16(2):125-137. Disponível em: <http://dx.doi.org/10.5027/psicoperspectivas-vol16-issue2-fulltext-1050>.
35. Valdés SX, Gloria Godoy RC, Mendoza AA. Acción colectiva y resistencia: asalariadas agrícolas en Chile frente a la precarización laboral. *Izquierdas*. 2017 [acceso em 2021 mar 10]; (35):167-198. Disponível em: <http://dx.doi.org/10.4067/S0718-50492017000400167>.
36. Giraldo OF. Campesinas construyendo la utopía: mujeres, organizaciones y agroindustrias rurales. *Cuad Desarro Rural*. 2010 [acceso em 2021 mar 9]; 7(65):41-57. Disponível em: <http://www.scielo.org.co/pdf/cudr/v7n65/v7n65a03.pdf>.
37. Becerra NME, Galán EYB, Cano LAP, et al. Condiciones laborales de mujeres rurales en cultivos de tomate bajo invernadero; el caso de Sáchica (Boyacá). *Cult Científica*. 2013 [acceso em 2021 abr 10]; (11):107-16. Disponível em: https://revista.jdc.edu.co/index.php/Cult_cient/article/view/179.
38. Suárez E, Mosquera T, Castillo SD. Empowerment and associative process of rural women: a case study of rural areas in Bogotá and Cundinamarca, Colombia. *Agron. colomb*. 2018 [acceso em 2021 abr 23]; 36(2):158-165. Disponível em: <https://doi.org/10.15446/agron.colomb.v36n2.66927>.
39. Campos-Gómez M, Miranda-Tortoló T, Oropeza-Casanova K, et al. Experiencia de género en el Programa de Innovación Agropecuaria Local en la provincia de Matanzas, Cuba. *Pastos Forrajes*. 2018 [acceso em 2021 mar 23]; 41(2):151-6. Disponível em: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-03942018000200010.
40. Mantilla MRY, Rosa M. Fuerza de trabajo femenina en la agricultura de exportación de brócoli en Cotopaxi (Debate Agrario -Rural). *Ecuador Debate*. 2015 [acceso em 2021 set 16]; (94):131-144. Disponível em: <http://repositorio.flacsoandes.edu.ec/handle/10469/9608>.
41. Arcury TA, Trejo G, Suerken CK, et al. Work and health among latina mothers in farmworker families. *J Occup Environ Med*. 2015 [acceso em 2021 ago 21]; 57(3):292-299. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4352714/>.
42. Pulgar CA, Trejo G, Suerken C, et al. Economic hardship and depression among women in latino farmworker families. *J Immigr Minor Health*. 2016 [acceso em 2021 ago 22]; 18(3):497-504. Disponível em: <https://pubmed.ncbi.nlm.nih.gov/26022147/>.
43. Arcury TA, Sandberg JC, Talton JW, et al. Mental health among latina farmworkers and other employed latinas in North Carolina. *Rural Ment Health*. 2018 [acceso em 2021 ago 19]; 42(2):89-101. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6141195/>.
44. Murphy J, Samples J, Morales M, et al. "They talk like that, but we keep working": Sexual harassment and sexual assault experiences among Mexican Indigenous farmworker women in Oregon. *J Immigr Minor Health*. 2015 [acceso em 2021 ago 18]; 17(6):1834-1839. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4128901/>.

45. Kim NJ-E, Vásquez VB, Torres E, et al. Breaking the silence: sexual harassment of Mexican women farmworkers. *J Agromedicine*. 2016 [acesso em 2021 ago 17]; 21(2):154-162. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5957069/>.
46. Ruiz Meza LE. Segregación de género en la asignación de derechos al agua en los sistemas de riego campesino en Chiapas, México. *Cuad Desarro Rural*. 2013 [acesso em 2021 set 17]; 10(72):201-222. Disponível em: <https://revistas.javeriana.edu.co/index.php/desarrolloRural/article/view/7030>.
47. Garay Villegas S. Diferencias estatales y regionales en el empleo rural femenino en México. *Estud. demogr. urbanos*. 2012 [acesso em 2021 abr 21]; 27(3):621-59. Disponível em: <https://doi.org/10.24201/edu.v27i3.1423>.
48. Ledesma MIM. Labor attributes and strategies: the case of tomato workers in San Luis Potosi, Mexico. *New Solut*. 2010 [acesso em 2021 abr 20]; 20(4):465-478. Disponível em: <https://pubmed.ncbi.nlm.nih.gov/21342870/>.
49. Guzmán Gómez G. La deuda: del sueño a la pesadilla colectiva. *Endeudamiento de mujeres rurales del centro de Veracruz*. *Desacatos*. 2014 [acesso em 2021 mar 15]; (44):67-82. Disponível em: https://www.scielo.org.mx/scielo.php?pid=S1607-050X2014000100006&script=sci_abstract.
50. Borja MCS, Díaz CHBR. Necesidades prácticas e intereses estratégicos de la mujer rural en aspectos socioeconómicos de su comunidad. *Investig Agrar*. 2010 [acesso em 2021 abr 10]; 12(2):101-106. Disponível em: <https://www.agr.una.py/revista/index.php/ria/article/view/155>.
51. Bojar I, Humeniuk E, Owoc A, et al. Exposing women to workplace stress factors as a risk factor for developing arterial hypertension. *Ann Agric Environ Med*. 2011 [acesso em 2021 abr 8]; 18(1):175-182. Disponível em: <https://pubmed.ncbi.nlm.nih.gov/21736283/>.
52. Raczkiwicz D, Saran T, Sarecka-Hujar B, et al. Work conditions in agriculture as risk factors of spinal pain in postmenopausal women. *Int J Occup Saf Ergon*. 2019 [acesso em 2021 mar 14]; 25(2):250-256. Disponível em: <https://pubmed.ncbi.nlm.nih.gov/28786763/>.
53. Davran MK, Öztornacı B, Özalp B. Socio-demographic and economic indicators in gender structure in the middle Taurus mountainous villages of Turkey. *Cienc. Rural*. 2019 [acesso em 2021 abr 5]; 49(12):1-10. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-84782019001200901&lang=pt.
54. Mascheroni P, Riella A. La vulnerabilidad laboral de las mujeres en áreas rurales: Reflexiones sobre el caso uruguayo. *Rev Cienc Soc*. 2016 [acesso em 2021 abr 6]; 29(39):57-72. Disponível em: http://www.scielo.edu.uy/scielo.php?pid=S0797-55382016000200004&script=sci_arttext.
55. Vitelli R, Borrás V. Las mujeres rurales durante el período progresista en Uruguay: Avances y tropiezos. *Rev Cienc Soc*. 2016 [acesso em 2021 abr 6]; 29(39):73-90. Disponível em: http://www.scielo.edu.uy/scielo.php?script=sci_arttext&pid=S0797-55382016000200005.
56. Chiappe M. Conflictos por uso de agroquímicos: el papel de las mujeres rurales en Uruguay. *Agrociencia Urug*. 2020 [acesso em 2021 mar 19]; 24(esp):1-15. Disponível em: http://www.scielo.edu.uy/scielo.php?script=sci_arttext&pid=S2301-15482020000301311&lang=pt.
57. Lara Flores SM. *Jornaleras, temporeras y bóias-frías: el rostro femenino del mercado de trabajo rural en América Latina*. 1. ed. Caracas: Editorial Nueva Sociedad; 1995.
58. Harvey D. *Condição pós-moderna: uma pesquisa sobre as origens da mudança cultural*. 17. ed. São Paulo: Ed. Loyola; 2008.
59. Delgado G. *Do "capital financeiro na agricultura" à economia do agronegócio: mudanças cíclicas em meio século (1695-2012)*. Porto Alegre: Editora da UFRGS; 2012. [acesso em 2021 nov 23]. Disponível em: <https://lume.ufrgs.br/handle/10183/245770>.
60. Davis AY. *Mulheres, raça e classe*. São Paulo: Boitempo; 2016.
61. Acselrad H. O conhecimento do ambiente e o ambiente do conhecimento: anotações sobre a conjuntura do debate sobre vulnerabilidade. *Rev Em Pauta Teor Soc e Real Contemp*. 2013 [acesso em 2021 nov 23]; 11(32):115-

129. Disponível em: <https://www.e-publicacoes.uerj.br/index.php/revistaempauta/article/view/10158>.
62. Saffioti HIB, Almeida SS. *Violência de gênero: poder e impotência*. Rio de Janeiro: Revinter; 1995.
63. Gomes R, Minayo MCS, Silva CFR. *Violência contra a mulher: uma questão transnacional e transcultural das relações de gênero*. In: Brasil. Ministério da Saúde. *Impacto da violência na saúde dos brasileiros*. 1. ed. Brasília, DF: Ministério da Saúde; 2005. p. 117-40
64. Carneiro FF, Augusto LGS, Rigotto RM, et al. organizadores. *Dossiê ABRASCO: um alerta sobre os impactos dos agrotóxicos na saúde*. Rio de Janeiro: São Paulo: Escola Politécnica de Saúde Joaquim Venâncio; Expressão Popular; 2015.
65. Beserra L, Oliveira LK, Pignati WA. *Contaminação sistêmica por agrotóxicos na chuva, águas, peixes e pecuárias em territórios do agronegócio em Mato Grosso*. In: Pignati WA, Correa MLM, Leão LHC, et al. organizadores. *Desastres sócio-sanitário-ambientais do agronegócio e resistências agroecológicas no Brasil*. 1. ed. São Paulo: Outras Expressões; 2021.
66. Chemnitz C, Wenz K, Haffmans S, organizadores. *Pestizidatlas: Daten und Fakten zu Giften in der Landwirtschaft 2022*. Berlin: Heinrich-Böll-Stiftung; 2022. [acesso em 2021 nov 10]. Disponível em: <https://www.boell.de/sites/default/files/2022-01/Boell-Pestizidatlas-2022.pdf>.
67. Organização das Nações Unidas para Agricultura e Alimentação. *Food and agriculture data*. [acesso em 2022 fev 18]. Disponível em: <https://www.fao.org/faostat/en/#data/RP>.
68. Pignati W, Soares MR, Leão LHC. *A cadeia produtiva do agronegócio, danos ambientais, acidentes de trabalho, agrotóxicos, doenças e pandemias: um resumo*. In: Pignati WA, Correa MLM, Leão LHC, et al. organizadores. *Desastres sócio-sanitário-ambientais do agronegócio e resistências agroecológicas no Brasil*. 1. ed. São Paulo: Outras Expressões; 2021.

Received on 03/24/2022

Approved on 10/06/2022

Conflict of interests: non-existent

Financial support: This publication was supported by the Deputy Directorate for Research and Innovation and the Public Health Post-Graduate Program at the Sergio Arouca National School of Public Health/Oswaldo Cruz Foundation (ENSP-FIOCRUZ)