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## ARTIGO ORIGINAL

### Pain characteristics and its influence in the labor activities in northeastern Brazilian farmers

#### *Características da dor e sua influência nas atividades laborais em agricultores do nordeste do Brasil*

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## Abstract

**Introduction:** Agricultural work is considered a dangerous activity with physical and mental stress. Pain is one of the most common disabilities among agricultural workers. **Objective:** To determine the incidence, intensity, characteristic of pain and its impact on labor activities in farmers. **Methods:** Transversal study, pain evaluations consist of: 1) presence / intensity; 2) characteristic of painful experience; 3) episode of pain in the last 30 days and 4) interference of pain at work. Validated and specific pain scales were used, and descriptive statistics were applied. **Results:** 157 rural farmers were recruited, 128 farmers, 40.4 (11.4) years, participated in the study, 25% of the farmers reported pain at the time of evaluation with mean of 5.5 (0.47) intensity. The predominant pain characteristic was the evaluative type (34%), followed by affective (30%), 83 (65%) of farmers reported pain in the last four weeks, and 60% of these farmers reported pain interference in work activity. **Conclusion:** Pain, according to farmers in this study, is the main cause of absence and poor performance at work. To accurately assess the intensity of work-related pain, instruments may need to be applied over a continuous period of time, preferably during work day.

**Key-words:** worker health, pain, pain assessment.

## Resumo

**Introdução:** O trabalho agrícola possui elevada carga de estresse físico e mental. A dor é uma das incapacidades mais relatadas, compreender esse fenômeno e sua interferência no trabalho é fundamental para intervenções eficazes na saúde do trabalhador. **Objetivo:** Determinar a incidência, intensidade, característica da dor e seu impacto no trabalho em agricultores. **Métodos:** Estudo transversal, as avaliações da dor contemplaram: 1) presença/intensidade; 2) característica da experiência dolorosa; 3) dor no último mês e, 4) interferência da dor no trabalho. Todas as escalas eram validadas e específicas para cada objetivo e a análise estatística foi descritiva. **Resultados:** 157 agricultores foram recrutados, participaram 128 agricultores, 40,4 (11,4) anos, 25% dos agricultores referiram dor no momento da avaliação com intensidade média 5,5 (0,47). A característica da dor predominante foi do tipo avaliativa (34%), seguida pela afetiva (30%). 83 agricultores (65%) referiram ocorrência de dor no último mês, e 60% destes relataram interferência da dor no trabalho. **Conclusão:** A dor, segundo os agricultores, é causadora de ausência e mau rendimento no trabalho. Avaliar com precisão a intensidade da dor relacionada ao trabalho talvez necessite de instrumentos aplicados em um período contínuo no tempo, durante a jornada de trabalho.

**Palavras-chave:** saúde do trabalhador, dor, avaliação da dor.

## Introduction

Agricultural work in Brazil is a significant activity from the social and economic points of view. However, not much data on the health of workers in this sector is available. This is a matter of concern because agricultural activity is considered an occupation that exposes workers to various occupational risks that affect their safety and health [1-3]. In addition to occupational risks, there are also intrinsic factors in the organization of rural agricultural work, characterized by long working hours, intensive working cycles, repetitive movements, excessive force, inappropriate posture and posture maintained over long periods of time, which significantly contribute towards high risk of developing diseases [4-7]. Musculoskeletal disorders followed by pain symptom are the injuries most investigated in the literature on agricultural activities, with emphasis on spinal, lower and upper-limb injuries [8-9].

Pain is defined as an unpleasant sensory and emotional experience, characterized by subjectivity and individuality. Investigations that propose to evaluate the sensory and emotional aspects of this phenomenon have been recommended, as well as, a biopsychosocial approach towards pain have also been discussed [10]. Although many studies have investigated pain among agricultural workers, most of them focused only on evaluating the intensity and location of the musculoskeletal pain [8,11-13].

The lack of approaches towards other aspects of painful experiences, such as sensory-discriminative, motivational-affective and cognitive-evaluative factors, constitutes a gap in studies on this population. Understanding the pain phenomenon as well as its characteristics and impact on work activities is essential for implementing effective public health interventions with emphasis on pain management among workers. The objective of the present study was to investigate the incidence, intensity and characteristics of pain and their impact on the work activities of rural agricultural workers in the municipality of Lagarto/SE, Brazil.

## Methods

This was a cross-sectional study with a descriptive approach conducted in the municipality of Lagarto, located in the central-southern area of the state of Sergipe, northeastern Brazil.

### *Sample*

Rural agricultural workers took part in this study. They were recruited from the register of Ministry for Work (Sergipe, Brazil) in an open call to all farmers interested in participating. The study sample were rural agricultural workers living in the settlements of Colônia Treze and Jenipapo, who were recruited through the Citrus Project, developed by the Nucleus of Research and Attention to the Worker's Health of the Federal University of Sergipe (UFS), Campus Universitário Prof. Antônio Garcia Filho, located in the municipality of Lagarto/SE. The sample was selected according to some criteria at the evaluation stations: The individuals selected were included if they agreed to sign a free and informed consent statement. They must have worked in agricultural activity for at least one year; were between 18 and 60 years of age; had not been diagnostic with orthopedic or neurological diseases. The present study was approved by the Research Ethics Committee of the Federal University of Sergipe.

### *Data collection*

Interviews and evaluations were performed in the settlements of the municipality of Lagarto/SE, by a previously trained team. Initially, sociodemographic and clinical information were collected using a questionnaire drawn up specifically for this study.

### *Pain evaluation protocol*

The pain evaluation took into account four aspects: presence/intensity, characteristics, pain episodes and interference in work activities. Firstly, the presence of pain among the workers

was evaluated through the following question: "Right now, are you feeling any pain?" the participants were asked to answer this question using "yes" or "no".

Next, the intensity of the pain at the time of the interview was measured using the Numeric Rating Scale (NRS) [14]. Through this instrument, the interviewees evaluated their pain on a scale from 0 to 10, where 0 represented "absence of pain" and 10, the "worst pain imaginable". The participants who presented pain intensity differing from 0 were asked to answer the McGill Pain Questionnaire (MPQ), which had the objective of investigating the characteristics of the reported pain. The MPQ is one of the questionnaires most cited internationally and is used in clinical practice [15] for evaluating the sensory, affective, temporal and miscellaneous qualities of pain. There is great evidence of the validity, reliability and discriminative ability of the MPQ when used among young adults and elderly people [16].

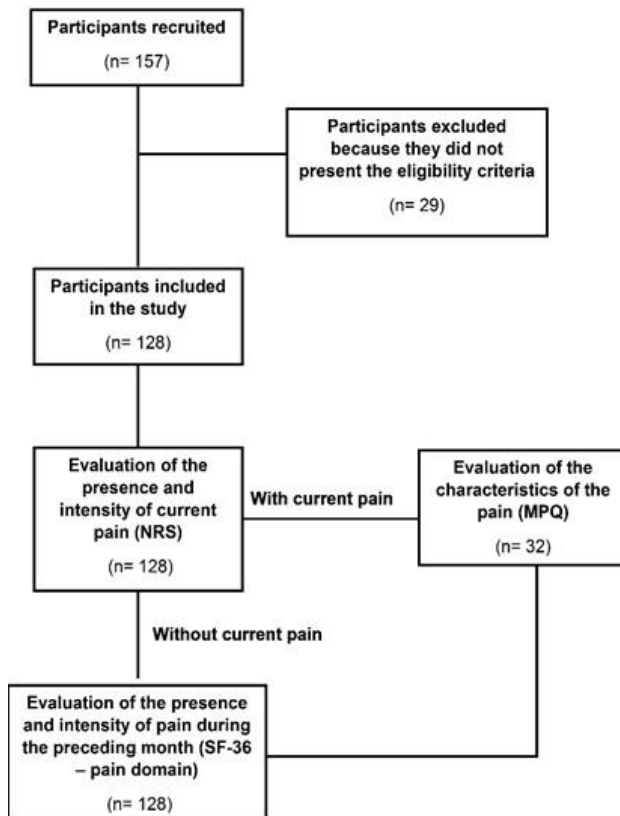
In order to investigate the presence of pain during the four weeks prior to the evaluation and whether this pain had interfered with work activities, the SF-36 Health Survey Update instrument was used [17]. Only information relating to the pain domain (items 7 and 8 of SF-36) were selected for use in this study, to explain the relation between pain occurrence and work productivity. The items evaluated were placed on a Likert-like scale, which ascertained the intensity of pain and the ensuing degree of limitation on working activities during the four weeks prior to the evaluation. All the participants, including those who did not present pain at the time of the interview, took part in the investigation relating to past episodes of pain and its interference in work activities.

#### *Statistical analysis*

Descriptive analysis was used, with calculation of medians, means, standard deviations, percentages and confidence intervals with SPSS software, version 22.0®.

## **Results**

Out of the sample of 157 rural agricultural workers who attended the evaluation days, two workers reported that they were not active workers, four workers were older than 60 years, sociodemographic data was missing in the cases of nine workers and 14 workers did not complete the evaluation. Therefore, these workers were not included in the present study (Figure 1).



**Figure 1** - Participants' flow chart.

The majority of the 128 participants included were male. Their mean age was  $40.4 \pm 11.4$  years old and 65% had been working in agriculture for over 10 years (median 25 years (minimal 10 years and maximal 50 years), all of them work in the citrus culture (main product was orange) and they do not have a specific activity, all of them worked in different activities, from sowing to collection. From asking about the use of pesticides at their workplaces, the prevalence of use was found to be 100% (Table I).

**Table I** - Demographic distribution of participants, years of rural agricultural work and use of pesticides.

Characteristics	Total (128)
<b>Age (mean; SD)</b>	40.4 (11.4)
<b>Sex (%; n)</b>	
Female	21.1% (27)
Male	78.9% (101)
<b>Years of rural agricultural work (%; n)</b>	
Up to 10 years	35% (24)
11 – 20 years	22.7% (29)
21 – 30 years	20.3% (38)
> 30 years	22% (37)
<b>Use of pesticides (%; n)</b>	100% (128)

% = percentage of participants studied; n = absolute frequency of participants studied; SD = standard deviation

The number of individuals who reported the presence of pain at the time of the evaluation was lower than the number who reported occurrences of pain during the four weeks prior to the evaluation (Tables II and III). On the other hand, the intensities of the current pain and pain that occurred during the four weeks prior to the evaluation were similar – with moderate intensity. There were no differences between sex, age and working time in relation to the presence and intensity of pain.

**Table II** - *Distribution of the presence, intensity and characteristics of pain at the time of the evaluation and during the four weeks prior to the evaluation.*

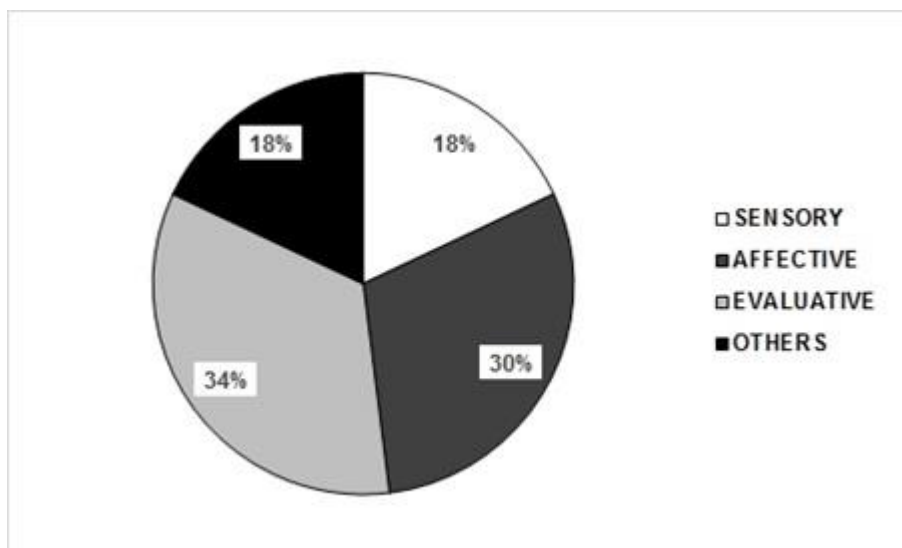
Pain	Total (128) % (n)
<b>Presence of pain at the time of the evaluation</b>	
With pain	25% (32)
Without pain	75% (96)
<b>Presence of pain during the four weeks prior to the evaluation</b>	
With pain	64.8% (83)
Without pain	32.2% (45)

% = percentage of participants studied; n = absolute frequency of the participants studied;

**Table III** - *Pain intensity values according to NRS and SF-36 (pain domain).*

Pain	Median	Mean	Standard deviation	95% CI
<b>NRS (n = 32)</b>	5.0	5.5	0.47	4.5 – 6.4
<b>Pain domain score (n = 83)</b>	40	44.0	2.4	39.1 – 48.8

The pain characteristics were evaluated through the MPQ only among individuals who reported having current pain. There was greater prevalence of the evaluative aspect of pain than miscellaneous, sensory and affective characteristics (Figure 2). When participants were asked about the local of the pain, often they answer that it was more than one segment.

**Figure 2** - *Current pain characteristics (MPQ).*

Through item 8 of SF-36, 83 farmers who reported pain four weeks prior to the evaluation were asked if pain interferes in their work activities, 60% of farmers (47 out of 83) reported pain interference in work activity. Then, they were asked about how much the pain interfered with development of work activities, the dominant answers were found to be "little (41%) and moderate (30%) interference", in comparison with "a lot (15%) and extreme (14%)" interference on the agricultural work of the individuals participating in the study.

## Discussion

The present study had the objective of evaluating the presence, intensity, characteristics, occurrence and impact of pain on the working activities of rural agricultural workers, in two specific districts in the state of Sergipe, northeastern Brazil. Aspects relating to the presence of pain at the time of the evaluation and occurrences of pain during the four weeks prior to the evaluation were investigated. The results showed that reports of the presence of pain at the time of the evaluations on the agricultural workers who were interviewed occurred at a percentage lower than the reports of pain during the four weeks prior to the evaluation. In addition, the participants

presented pain of moderate intensity, both at the time of the evaluation and during the month prior to it. The most predominant characteristic of the pain at the time of the evaluation was the evaluative type. Most of the workers reported that the pain interferes in their work activities.

Our results regarding the presence of pain are different from those of many of the studies on this population because the present study investigated pain at two different times, i.e. the time of the interview and over the four weeks prior to the evaluation. One of the studies that had similar characteristics to ours was conducted by Brock et al. [18], who evaluated the musculoskeletal health of 83 rural agricultural workers in southern Georgia, using questions about the current painful experience or experiences over the past 30 days. However, when presenting the results, they did not specify which individuals presented pain at each time evaluated. They only stated that 81.9% reported pain and distributed this proportion according to a few types of pain.

There was higher prevalence of pain in the present study during the four weeks prior to the evaluation, which can be related to a possible chronic characteristic. It can perhaps be explained by the length of time spent in this work activity, given that Hong Xiao et al. [19], stated that the number of years of agricultural work is directly associated with chronic pain. The low prevalence of the presence of pain during the interview can be explained by the fact that the evaluations took place on days when the workers were inactive. Another explanation may come from sexual differences. The sample in the present study consisted almost entirely of men, and studies have revealed that men present lower sensitivity to pain than women [20] and are also less willing to report it [21]. Moreover, men's memories of painful, non-pleasurable experiences tend to be more precise than those of women who have experienced a similar situation [22]. This may explain why there were more reports of pain occurring during the four weeks prior to the evaluation than what was reported at the time of the evaluation of the present study. Psychosocial factors can also play an important role [23]. For example, during the interview, workers may have felt embarrassed about reporting pain for various reasons, such as the shame of admitting that they were feeling pain at the time of the interview, or because they thought that if they said that they were in pain, they would not proceed to the other tests.

Regarding the records of pain characteristics, there is a lack of studies relating to characterization of pain among rural agricultural workers. Most of such studies have focused on studying only the location of the pain among the body segments [10,24,25]. In a study that evaluated physical function and pain among workers with impingement syndrome through a questionnaire specific for shoulder evaluation, as well as through the MPQ [26] highlighted the importance of studies that investigate pain to also investigate pain characteristics. Furthermore, such studies can contribute towards the clinical diagnosis because knowing the characteristics of the pain is an important tool in communicating about the painful experience. Thus, studying pain by focusing only on the intensity and location may result in weak evidence.

Among the results from the present study, the evaluative characteristic of the painful experience presented greater predominance. This corresponds to the individual's overall painful experience and is directly linked to psychocognitive units such as memory, attention and previous experience [16,27]. Similar data were found by Basher et al. [28], in which 40.6% out of 200 agricultural workers studied reported the pain as being wearisome, thus revealing a very subjective aspect of pain. However, differently from these authors, we used the MPQ a validated questionnaire.

This study also investigated the extent to which the painful experience reported from the month prior to the evaluation interfered with the participants' work activities. The importance of this investigation was reinforced by a study conducted by Milani and Monteiro [29], among 204 rural agricultural machine operators in which the presence of musculoskeletal symptoms was evaluated through the Nordic Musculoskeletal Questionnaire and the capacity for work was evaluated through the Work Ability Index. They found that the capacity for work was directly correlated with the presence of musculoskeletal symptoms.

Despite of the 65% of farmers reported interference of pain with work activities, the intensity of this interference was reported as "little" to "moderate" possibly associated with factors relating to the psychodynamics of agricultural work in the area studied, given that many workers did not have employment contracts and worked seasonally. This might inhibit individuals from stating that they are in pain, for fear of being replaced by another worker and losing their only source of income [30]. The results of this study demonstrated the occurrence of painful episodes in farmers, but, unfortunately, up to date there are no clinical studies of physiotherapeutic interventions in this population.

Although, this study has strong points, such as the evaluation of the intensity of pain at two different times, evaluation of pain characteristics with validated instruments. The results from

this study should be interpreted within their limitations. Firstly, a cross-sectional approach was adopted, which therefore does not provide the possibility of evaluating causality. Other limitation is related to the fact that the sample was local to the municipality of Lagarto and to the state of Sergipe, which only allow generalization of the results to other rural agricultural workers in other states of Brazil, who might be subject to similar labor-law policies.

## Conclusion

Farmers workers are more prompted to report pain that occurred during the four weeks prior to the evaluation than the present pain. The evaluative characteristics of the most predominant painful experiences revealed the overall subjective way the painful phenomenon was perceived by these individuals. The results found in this study may be useful for understanding the painful experiences of this population and for effectively guiding the provision of preventive occupational healthcare. There is still a need to establish data of greater precision to explain occurrences of pain and its association with work activities, maybe using continuous measurements during the labor journey. More important, it is urgent that more clinical studies exploring the effects of physical therapy interventions to improve pain in farmers be performed.

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