

Presenteeism among fruit farm workers in Northeast Brazil: cross-sectional study

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Abstract: The scientific literature about presenteeism among farm workers is scarce. This study estimated the prevalence of and factors associated with presenteeism among paid fruit farm workers. A cross-sectional study investigated 340 paid employees of both sexes, aged 18 years or above, who worked during the 2019 irrigated fruit harvest in the municipality of Petrolina, Northeast Brazil. Information about sociodemographic characteristics, lifestyle, general health status, occupational characteristics, interpersonal work aspects, and the work environment's structural characteristics was collected in a structured questionnaire. Presenteeism was established when participants reported working one or more days during the previous season despite feeling ill or when injured. Cox regression was used to estimate prevalence ratios adjusted by sex, area of residence (urban or rural), employment contract (permanent or seasonal), satisfaction with management, participation in workplace decision-making, availability of on-site healthcare facilities, and on-site availability of sunscreen. The prevalence of presenteeism during the previous season was high: 58.2%. In the final multivariate model, the adjusted prevalence ratio was higher (≥ 1.20) among female workers (1.42), workers dissatisfied with management (1.28), and those for whom sunscreen was not available on site (1.61). The prevalence of presenteeism was high and associated with personal, work organizational, and workplace resources characteristics.

Key words: Agricultural workers' diseases, Crops, Agricultural, Fruit, Presenteeism, Working conditions

Introduction

Presenteeism, or going to work despite feeling physically or psychologically sick¹, is frequently found among workers from a range of occupations all around the world^{2,3}. However, there is no standard metric for measuring pre-

senteeism⁴. The reason for this fact relies on two different conceptions of presenteeism. The “epidemiological” approach, predominant among European authors, is mainly interested in the frequency of the act of presenteeism and on occupational traits responsible for workers' stress and illness. The “productivity” approach, predominant (but not exclusively) among American authors in occupational medicine, focus on productivity losses stemming from attending while ill⁵⁻⁷. Typically, the “epidemiological” approach uses a single-item question to measure presenteeism

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such as “Has it happened over the previous 12 months that you have gone to work despite feeling that you really should have taken sick leave due to your state of health?”²⁾. The “productivity” approach of presenteeism uses standardized instruments, like the Stanford Presenteeism Scale⁸⁾ and other ones^{9–13)}.

A review⁵⁾ reported that presenteeism rates varied from 30 to more than 90%, based on the results of 19 studies from 15 countries. These studies used one-item question to measure the prevalence of presenteeism.

To the best of our knowledge, only four studies evaluated presenteeism among farm workers. Three of these studies^{14–16)} used the productivity approach and only one¹⁷⁾ used the epidemiological approach. The latter study reported a 5.0% prevalence rate of presenteeism in the latter season, among migrant farm workers in North Carolina, USA.

In the genesis of the act of presenteeism one can identify personal motivations, through which the worker exerts himself because of engagement in and commitment to the job, to colleagues or to clients, and factors related to workplace pressure, through which the worker endeavours to avoid punishment, financial losses, or losing the job itself, as well as reproaches from management or colleagues¹⁸⁾. The factors triggering the act of presenteeism reveal various patterns, depending on the nature of the work activity¹⁹⁾.

Paid agricultural workers are usually involved in strenuous and hazardous manual labour²⁰⁾, subject to precarious and temporary employment contracts^{21, 22)}, present high rates of occupational diseases and injuries, have difficulties accessing health services, are on low incomes, and have low levels of education^{23, 24)}. It is therefore plausible to suppose that presenteeism among rural agricultural workers presents different patterns to those found among other categories of workers.

This study aims to estimate the prevalence of, and identify factors associated with, presenteeism among paid fruit farm workers in Northeast Brazil.

Materials and Methods

A cross-sectional study was conducted with paid crop farm workers in irrigated fruit enterprises in the municipality of Petrolina, in the State of Pernambuco, Brazil (Fig. 1). Petrolina is situated in a semi-arid region, on the left bank of the São Francisco river. In 2010, the city had 354,317 inhabitants and a municipal Human Development Index of 0.697²⁵⁾. Due to its location and significant investment in irrigation, Petrolina has become a prosperous area for the



Fig. 1. Caption: Petrolina municipality in Brazil and South America.

Footnote: CIA World Factbook / public domain, modified.

production and export of fruit, especially grapes and mangoes²⁶⁾. Fruit production is the main source of direct and indirect employment in the region. Hiring the workforce for these fruit crops is seasonal and depends on the phase of production. Employment contracts start in May, during the pre-harvest season, and intensify from July to September during fruit harvesting and packing. Mean monthly salary was US\$ 282, without bonuses. The employment contracts and respective payments are regulated by the national work legislation and by the Collective Labor Agreement of workers in fruitculture. This Agreement assures a 50% bonus over the standard working hour for first two hours in overtime, and a 70% bonus for the subsequent hours. In October and November, when the harvest ends and the contract expires, most of the workforce is dismissed²⁷⁾. Once dismissed, there are few formal employment options in the region.

During the intercrop period, workers in irrigated fruitculture live on casual labour and a cash transfer programme of the Pernambuco state government called *Chapéu de Palha da Fruticultura* (Straw Hat Fruit Production benefit)²²⁾. The

Chapéu de Palha da Fruticultura programme transfers an amount of money to each family of unemployed people who worked in the irrigated fruit farming during the last harvest. In 2019, the programme paid four monthly instalments of 282 reais (Brazilian currency), the equivalent of US\$ 73, conditional on participation in training courses.

The study included all 7,116 paid crop farm workers, aged 18 years or above, who worked in the 2019 irrigated fruit crop season in Petrolina and participated in the 2020 *Chapéu de Palha da Fruticultura* Programme. We excluded those workers unable to respond to the questionnaire for physical or mental reasons.

A pilot study²⁸⁾ conducted with 40 workers in the local fruit crop industry found a 67.5% prevalence of presenteeism over the previous 12 months. To estimate the prevalence of presenteeism over the last 12 months, assuming the prevalence of 67.5%, with an absolute error of 5%, a confidence level of 95% and for a finite population of 7,116 individuals, we calculated a minimum sample size of 325. The study sample was proportionally stratified according to the number of expected workers in enrolment locations for the *Chapéu de Palha da Fruticultura* Programme - five in rural areas and one in the urban area of Petrolina.

A team of appropriately trained nursing undergraduate students applied an individual semi-structured questionnaire. Data collection occurred between January 27 and February 5, 2019, in the five *Chapéu de Palha da Fruticultura* Programme enrolment locations. Workers queuing in the enrolment locations were consecutively invited to share the study after signing an informed consent term. A total of 348 workers responded to the questionnaire, although eight gave very incomplete answers and were excluded from the study.

Dependent variable

Presenteeism was determined by their answer to the question “How many days have you worked this season when you were injured or ill?” Participants who reported one or more days were considered to demonstrate presenteeism¹⁷⁾.

Presenteeist workers were asked to report the most important reason for going to work despite feeling ill or being injured and their answers were classified as: “symptoms were bearable”, “afraid of losing job”, “I don’t enjoy missing a working day”, “I couldn’t get a medical certificate”, “to achieve goals/to get productivity bonuses”, and “I would rather go to work than stay at home”.

Independent variables

Sociodemographic variables

Age was categorized into age groups of 18–31 or 32–59 years (according to the median of 31 years); schooling (>5 or ≤5 years of study), area of residence (rural or urban area), skin colour (White or non-White), main contributor to family income (the worker or other relatives: their partner, both worker and partner, parents, grandparents, children).

General health status

Self-reported evaluations of workers’ general health were dichotomized as poor/regular or good/very good. Chronic health problems were defined as having been diagnosed by a medical doctor and with a duration of over six months, dichotomized as yes or no. The number of flu or common cold episodes in the last 12 months were dichotomized as None = no or One or more = yes. Work-related disease or injury were based on worker self-report regarding his/her activity in the fruit crop industry during the previous season, dichotomized as yes or no. Use of analgesics in the previous 15 days was categorized as yes or no, based on a question of a national survey about access to and use of medicines²⁹⁾. Absenteeism was considered when the worker reported that he/she had not shown up for scheduled work at least one day⁵⁾ during his/her last employment contract in the fruit crop industry, and coded as yes or no.

Lifestyle

Alcohol consumption was defined as the ingestion of five or more doses of alcohol for men, and four or more for women on at least one occasion over the previous month, dichotomized as yes or no³⁰⁾. Physical exercise was categorized according to weekly frequency into ≤2 days a week or ≥3 days a week³⁰⁾. Travelling to and from the workplace on foot or bicycle was categorized as yes (all or most of the way) or no (not for all or part of the way)³⁰⁾.

Occupational characteristics

Length of time as a paid rural worker was categorized into <7 years or ≥7 years, according to the median of 7 years); work location (packing house or field); type of employment contract with the fruit crop enterprise, categorized as permanent or temporary (contract with a predetermined end date); duration of employment contract was categorized into ≥4 months or <4 months, according to the median of 4 months); weekly working hours (<44 hours or ≤44 hours, according to the median of 44 hours); extra

working hours (yes or no); received productivity bonus (yes or no); and work breaks allowed (yes or no).

Interpersonal work aspects

The questions about satisfaction in relationship with colleagues (Have you been satisfied with the relationship with your colleagues?), satisfaction in relationship with management (Have you been satisfied with the way your supervisor used to treat you?), and participation in workplace decision-making (Did you participate in decisions about your job activities?) were answered as yes or no.

Workplace resources and facilities

Workers' opinions about the availability of on-site healthcare facilities, adequate bathrooms, drinking water, canteens, sun protection clothing, sunscreen, and personal protective equipment were dichotomized as yes or no.

Data analysis

Since presenteeism depends on illness¹⁹, the variables related to general worker health (chronic health problems, flu/common cold, work-related diseases or injuries, general health status, use of analgesics, and absenteeism) were presented in descriptive form in order to characterize the act of presenteeism. Exploring variables so closely related to the outcome can lead to an over- or under-estimation of the main association. For the other variables we investigated (sociodemographic, lifestyle, occupational characteristics, interpersonal work aspects, and workplace resources and facilities), we calculated the crude prevalence ratio (PR-crude) for the presenteeism outcome during the previous harvest season.

We used multivariate Cox regression³¹ to calculate prevalence ratios, adjusted for the independent variables (predictors), and also implemented two Cox regression models. The variables we entered in the models were selected on the basis of the magnitude of their bivariate association with the outcome and their theoretical plausibility. To compose the first (saturated) model, we selected the variables presenting $PR \geq 1.20$. We chose this PR value because of the high prevalence of presenteeism in the study population. Only variables with $PR \geq 1.20$ remained in the final (adjusted) model. We opted to include and maintain the employment contract variable in the final model, due to the notorious influence of precarious job contracts on presenteeism⁵. The work location variable was also maintained in the final model, since field workers are more exposed to sunlight and the effects of the hot climate than packing house workers³².

This study was based on a non-probabilistic sample, meaning that the use of statistical inference is inappropriate. The 95% confidence limits presented here merely provide a biased estimated precision. We did not use these confidence intervals to select the variables to form the regression models or to make any kind of statistical inference^{33–35}.

Statistical analyses were performed using SPSS (Statistical Package for the Social Sciences), version 22 (IBM Corporation, Armonk, NY, USA).

This study was approved by the Committee for Ethics in Research on Human Beings at the Feira de Santana State University, under opinion number 3.554.663.

Results

Presenteeism during the previous season was found in 58.2% of the 340 agricultural workers investigated. The most frequent reasons claimed by the 198 presenteeist workers for having gone to work despite feeling ill or being injured were: “symptoms were bearable” (26.8%), “afraid of losing job” (26.3%), “I don’t enjoy missing a working day” (24.7%), “I couldn’t get a medical certificate” (16.7%), followed by “to achieve goals/to get productivity bonuses” (3.5%), and “I would rather go to work than stay at home” (2.0%).

Bivariate analyses revealed that the prevalence of presenteeism of chronic diseases, flu or common cold episodes, work-related diseases or injuries, poor or regular health status, use of analgesics, and absenteeism was more frequently reported by presenteeist workers (Table 1). Further, the prevalence of presenteeism was substantially higher ($PR \geq 1.20$) among female workers ($PR=1.46$), living in rural areas ($PR=1.21$) (Table 2), dissatisfied with management ($PR=1.27$), who reported no participation in workplace decision-making ($PR=1.28$) (Table 3), and for whom on-site healthcare facilities ($PR=1.36$) and on-site sunscreen ($PR=1.71$) were not available (Table 4).

The multivariate analyses began with a saturated model containing the variables that demonstrated a $PR \geq 1.20$ in the bivariate analyses: sex, area of residence, satisfaction with the management, participation in workplace decision-making, availability of on-site healthcare facilities and on-site sunscreen, work location and employment contract. The final adjusted model revealed that the variables female sex ($RPaj \geq 1.42$), dissatisfaction with management ($RPaj \geq 1.28$), and lack of on-site sunscreen ($RPaj \geq 1.61$) remained strongly associated with presenteeism, even when controlling for work location and employment contract (Table 5).

Table 1. Presenteeism during the previous season according to characteristics reported by 340 agricultural workers in irrigated fruit crop enterprises, Petrolina, Brazil

Characteristic	Presenteeism				PR
	Yes		No		
	N	%	N	%	
Chronic health problem					
Yes	73	70.2	31	29.8	1.32
No	125	53.0	111	47.0	1
Flu or common cold					
Yes	110	70.1	47	29.9	1.46
No	88	48.1	95	51.9	1
Work-related disease or injury					
Yes	149	69.6	65	30.4	1.79
No	49	38.9	77	61.1	1
General health status					
Poor/Regular	78	73.6	28	48.7	1.44
Good/Very good	120	51.3	114	26.4	1
Use of analgesics*					
Yes	115	71.4	46	28.6	1.54
No	81	46.3	94	53.7	1
Absenteeism					
Yes	103	67.8	49	32.2	1.34
No	95	50.5	93	49.5	1

PR Prevalence ratio

* Missing cases n=4

Discussion

In this study, the prevalence of presenteeism during the previous season (58.2%) was high compared to that of 5.0% found among migrant farm workers in North Carolina, USA, using the same method for measuring prevalence¹⁷. Unfortunately, the focus of the other few studies that evaluated presenteeism among farm workers was not epidemiological, but on productivity, making it impossible to compare their results with ours. The prevalence of presenteeism in the last 12 months was also high among workers in other sectors of the economy: 32.3% in a food processing industry³⁶; 58.7% in the construction industry⁴; and 68.5% in office workers³⁷.

In this study, workers reported their reasons for presenteeism to be: fear of losing job (26.3%), and the impossibility of acquiring a medical certificate to evidence their disease or injury (16.7%). These reasons differ from those reported by workers randomly selected from the working

populations of Norway and Sweden: “Don’t want to burden my colleagues” (43%), “I enjoy my work” (37%), and “Nobody else is able to carry out my responsibilities” (35%)³⁸.

The high physical and psychological demands of agricultural work favour illness²⁰ and, consequently, absenteeism. The high prevalence of absenteeism (67.8%) during the previous crop season found in the presenteeist workers indicates the close relationship between these two phenomena⁵. The literature suggests that presenteeism is a precedent of absenteeism, and both events can contribute to the cycle that leads to a deterioration in worker health^{17, 19, 39}.

Among workers of the female sex, the adjusted prevalence rate for presenteeism was 1.42 times higher than among male workers. Gender stereotypes may influence work and health-related behaviours⁴⁰. Activities in the Petrolina irrigated fruit crop industry are divided along gender lines. Women are usually involved in harvesting, thinning, and packing, which are typically seasonal activities related to temporary, short-term employment contracts²¹. Female workers are therefore more prone to pre-

Table 2. Presenteeism during the previous season according to sociodemographic characteristics and lifestyle reported by 340 agricultural workers in irrigated fruit crop enterprises, Petrolina, Brazil

Characteristic/lifestyle	Presenteeism				Prevalence ratio
	Yes		No		
	N	%	N	%	
Sex					
Female	116	69.5	51	30.5	1.46
Male	82	47.4	91	52.6	1
Age (years)*					
18-31	107	62.6	64	37.4	1.15
32-59	91	54.2	77	45.8	1
Skin colour**					
Non-White	170	58.6	120	41.4	1.10
White	25	53.2	22	46.8	1
Schooling (years of study)*					
>5	109	55.1	71	50.4	1.08
≤5	89	44.9	70	49.6	1
Area of residence					
Rural	126	62.5	75	37.5	1.21
Urban	72	51.8	67	48.2	1
Main contributor to family income*					
Other relatives	101	61.6	63	38.4	1.11
Worker him/herself	97	55.4	78	44.6	1
Alcohol consumption					
Yes	59	62.8	35	37.2	1.11
No	139	56.5	107	43.5	1
Physical exercise					
≤2 days a week	147	59.3	101	40.7	1.07
≥3 days a week	51	55.4	41	44.6	1
Travels to work on foot or bicycle					
No	73	59.3	50	40.7	1.03
Yes	125	57.6	92	42.4	1

* Missing case n=1; ** Missing cases n=3

senteeism, since they might be afraid of losing future job contracts. Compared to men, female agricultural workers report good health less frequently²⁴), and present more absenteeism¹⁴). The limited provision of formal jobs in most economy sectors, including agriculture, means that these women are even more dependent on temporary work in fruit farming, especially if they live in rural areas²²).

In this study, psychological work-related aspects, such as dissatisfaction with the management and lack of participation in workplace decision-making were associated with greater prevalence of presenteeism, as reported in previous studies^{5, 41}). However, a reverse effect cannot be ruled out,

considering the nature of studies with a cross-sectional design⁵). In other words, presenteeism could also lead to job dissatisfaction, as reported elsewhere⁴²). Despite its importance, there continues to be no uniform definition for the phenomenon of presenteeism in research, nor is there any standard method to measure it. Empirical studies about presenteeism correlates cannot therefore clearly distinguish between cause and effect⁵).

In order to comply with Brazilian labour laws for the fruit crop industry, the management has to provide appropriate clothing to protect workers against sunlight (at the very least, head bands) and on-site sunscreen⁴³). Exposure

Table 3. Presenteeism during the previous season according to occupational characteristics and interpersonal work aspects reported by 340 agricultural workers in irrigated fruit crop enterprises, Petrolina, Brazil

Occupational characteristic/ Interpersonal work aspect	Presenteeism				PR
	Yes		No		
	N	%	N	%	
Time as a paid rural worker					
<7 years	104	59.1	72	40.9	1.03
≥7 years	94	57.3	70	42.7	1
Work location					
Field	146	58.9	102	41.1	1.04
Packing House	52	56.5	40	43.5	1
Employment contract*					
Permanent	36	62.1	22	37.9	1.07
Seasonal	162	57.9	118	42.1	1
Employment contract duration**					
≥4 months	72	59.5	49	40.5	1.02
<4 months	108	58.1	78	41.9	1
Weekly working hours					
>44 hours	143	58.8	100	41.2	1.04
≤44 hours	55	56.7	42	43.3	1
Extra working hours					
Yes	152	58.9	106	41.1	1.05
No	46	56.1	36	43.9	1
Productivity bonus					
Yes	123	59.1	85	40.9	1.04
No	75	56.8	57	43.2	1
Work breaks allowed					
No	104	61.9	64	38.1	1.13
Yes	94	54.7	78	45.3	1
Satisfaction with colleagues					
No	17	58.6	12	41.4	1.01
Yes	181	58.2	130	41.8	1
Satisfaction with management					
No	33	71.7	13	28.3	1.27
Yes	165	56.1	129	43.9	1
Participation in workplace decision-making					
No	134	63.5	77	36.5	1.28
Yes	64	49.6	65	50.4	1

* Missing cases n=2; ** Missing cases n=33

to the hot climate and sunlight, usually without breaks or appropriate clothing, can lead to serious health problems over both the short- and long-term^{32, 44, 45}). In this study, sun-screen was not available to 79.4% of the workers, while 50.3% did not receive sun protection clothing, which could

have contributed to the prevalence of presenteeism. When enterprises ignore health and safety regulations in the workplace, they expose their employees to unnecessary risks. Such abusive contexts can lead workers to adopt risky behaviour, such as going to work despite feeling ill,

Table 4. Presenteeism during the previous season according to availability of workplace resources and facilities reported by 340 agricultural workers in irrigated fruit crop enterprises, Petrolina, Brazil

Availability at the workplace of:	Presenteeism				PR
	Yes		No		
	N	%	N	%	
Healthcare facilities					
No	87	70.2	37	29.8	1.36
Yes	111	51.4	105	48.6	1
Adequate bathrooms					
Yes	184	58.4	131	41.6	1.04
No	14	56.0	11	44.0	1
Drinking water					
Yes	173	58.2	124	41.8	1.00
No	25	58.1	18	41.9	1
Canteen					
Yes	184	58.4	131	41.6	1.04
No	14	56.0	11	44.0	1
Sun protection clothing					
No	108	63.2	63	36.8	1.18
Yes	90	53.3	79	46.7	1
Sunscreen					
No	172	63.7	98	36.3	1.71
Yes	26	37.1	44	62.9	1
Personal Protective Equipment					
No	15	60.0	10	40.0	1.03
Yes	183	58.1	132	41.9	1

Table 5. Crude (PR_{crude}) and adjusted (PR_{adj}) prevalence ratios (PR) of presenteeism during the previous season according to predictors among 338 agricultural workers in irrigated fruit crop enterprises, Petrolina, Brazil

Predictors (referent)	PR _{crude} (IC 95%)	PR _{adj} (IC 95%)	PR _{adj} (IC 95%)
		Saturated model	Adjusted model
Female sex (male)	1.46 (1.10–1.94)	1.36 (1.02–1.82)	1.42 (1.06–1.88)
Area of residence - rural (urban)	1.21 (0.90–1.61)	1.17 (0.87–1.59)	-
Participation in workplace decision-making (yes)	1.28 (0.95–1.72)	1.17 (0.86–1.59)	-
Healthcare facilities available at workplace (yes)	1.36 (1.03–1.81)	1.16 (0.86–1.57)	-
Satisfaction with management (yes)	1.28 (0.88–1.86)	1.23 (0.84–1.80)	1.28 (0.88–1.86)
Sunscreen available at workplace (yes)	1.71 (1.13–2.59)	1.50 (0.98–2.29)	1.61 (1.06–2.44)
Work location - field (<i>packing house</i>)	1.04 (0.76–1.43)	0.99 (0.71–1.40)	1.08 (0.78–1.50)
Employment contract - temporary (permanent)	0.93 (0.65–1.34)	0.96 (0.66–1.39)	0.93 (0.65–1.35)

creating a perverse chain of illness, presenteeism and fear^{37, 42).}

Certain study limitations and strengths must be taken into account. In the context of a cross-sectional study such

as this, reverse causality cannot be ruled out and the associations reported here should be interpreted with caution. The inclusion of workers enrolled in the *Chapéu de Palha na Fruticultura* Programme may limit the generalization of

the results to other populations. However, this strategy allows us to access a large section of the eligible population, in a location some distance from the influence of management, which could, in itself, have caused information bias. Despite its limitations, the study's results are relevant, given the scarcity of national and international studies about presenteeism among crop farm workers.

Conclusions

There is a lack of studies in the scientific literature about the prevalence of presenteeism among farm workers. This study revealed that the prevalence of presenteeism is rampant among crop farm workers in irrigated fruit crop sector in Brazil. The prevalence of presenteeism was positively associated with factors related to personal (feminine sex), work organizational (dissatisfaction with management), and workplace resources (on-site unavailability of sun-screen) characteristics. It is recommendable that other studies investigate the prevalence of and factors associated with presenteeism in other non-formal working populations.

Conflict of Interest

The authors declare no conflict of interest.

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