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 world²,³. However, there is no standard metric for measuring presenteeism⁴. 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.
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 Scale3) and other ones9–13).

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 studies14–16) 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 colleagues19). 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 contracts21, 22), present high rates of occupational diseases and injuries, have difficulties accessing health services, are on low incomes, and have low levels of education21, 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 production and export of fruit, especially grapes and mangos26). 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).
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 medicines. Absenteeism was considered when the worker reported that he/she had not shown up for scheduled work at least one day 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 no. Physical exercise was categorized according to weekly frequency into ≤2 days a week or ≥3 days a week. 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).

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 illness, 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 regression 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≥1.20. We chose this PR value because of the high prevalence of presenteeism in the study population. Only variables with PR≥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 presenteeism. 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 workers.

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.

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≥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≥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≥1.42), dissatisfaction with management (RPaj≥1.28), and lack of on-site sunscreen (RPaj≥1.61) remained strongly associated with presenteeism, even when controlling for work location and employment contract (Table 5).
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 illness\(^20\) 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 phenomena\(^5\). 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 behaviours \(^40\). 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 contracts\(^21\). Female workers are therefore more prone to pre-

### 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 prevalence\(^17\). 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 industry\(^30\); 58.7% in the construction industry\(^6\); and 68.5% in office workers\(^37\).

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%)\(^38\).

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### 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
senteeism, since they might be afraid of losing future job contracts. Compared to men, female agricultural workers report good health less frequently\textsuperscript{24}, and present more absenteeism\textsuperscript{44}. 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 areas\textsuperscript{22}.

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\textsuperscript{5, 41}. However, a reverse effect cannot be ruled out, considering the nature of studies with a cross-sectional design\textsuperscript{5}. In other words, presenteeism could also lead to job dissatisfaction, as reported elsewhere\textsuperscript{42}. 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 effect\textsuperscript{5}.

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 sunscreen\textsuperscript{43}.

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 |  |  |
|--------------------------|-------------|---|---|
|                         | Yes | % | No | % | Prevalence ratio |
| 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 | 49.6 | 1.08 |
| ≤5                       | 89  | 44.9 | 70 | 50.4 | 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
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.

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\textsuperscript{32, 44, 45}. In this study, sunscreen was not available to 79.4% of the workers, while 50.3% did not receive sun protection clothing, which could

| 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
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 creating a perverse chain of illness, presenteeism and fear.

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

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 (PRcrude) and adjusted (PRadj) 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%) |
|-----------------------------------|---------------------|-------------------|
|                                   | 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 (packing house) | 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) |
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 sunscreen) 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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