


ORIGINAL ARTICLE

OCCUPATIONAL DISEASES IN PROFESSIONALS FROM A PLASTER PRODUCTION COMPLEX: A CROSS- SECTIONAL STUDY

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ABSTRACT

Objective: to know the prevalent occupational diseases and symptoms in workers from a plaster production complex. Method: this is a cross-sectional study conducted with 67 workers of a plaster factory from the city of Grajaú, Maranhão, Brazil. A semi-structured questionnaire with open and closed questions was used for data collection. The data were analyzed by means of the descriptive statistics usual procedures. Results: the sample consisted of 67 workers, of which 63 were male (94%). Six (9%) workers from the sample presented work-related diseases. The predominant symptoms were the following: irritation in the eyes; irritation on the skin; pain in the joints; irritation in the nasal mucosa; and respiratory problems. Conclusion: these results point to indicators that can be used as a parameter to support decision-making regarding public policies aimed at workers' health in the context of gypsum mining.

DESCRIPTORS: Occupational Exposure; Workers' Health; Risk Behaviors for Health; Mining; Occupational Nursing.

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INTRODUCTION

Work has been present since the dawn of humanity and, with the evolution of the human species, there was also evolution in the activities and, with them, emergence of several occupational diseases¹. The capitalist work mode is determined by the production process, in which accidents and illness are the result of social relationships in which workers become attachments to the machines².

Every work process indicates certain risk to the worker's health, which in some situations can be susceptible to harmful agents, depending on the type of activity carried out during workday and on the exposure time³. With the emergence of occupational diseases, the area of occupational health was created, a public health field that comprises the articulation of knowledge and practices delimited by the interrelationships between production, work and health, in the socio-environmental context of the development of human societies⁴.

Among the various work areas that make these workers susceptible to harmful agents to health, we can highlight those carried out in plaster factories, which, in addition to favoring respiratory tract diseases, expose them to accidents that can generate irreversible physical and psychological trauma⁵. Due to the risks related to the health and safety of individuals who work with plaster, monitoring by a team of specialized professionals becomes relevant, in order to guarantee safety and improve their quality of life³.

Due to the need to understand the epidemiological factors that affect workers' health in the context of plaster production, this article had the following guiding question: Which are the prevalent symptoms and diseases among workers in the context of a plaster production complex? Consequently, the objective of this study was to know the prevalent occupational diseases and symptoms in workers from a plaster production complex.

METHOD

This is an exploratory-descriptive research study, with a cross-sectional modality and a quantitative approach, conducted in December 2018 in the city of Grajaú, Maranhão, Brazil. The research was conducted in a large-sized plaster factory that is part of the plaster production complex of the aforementioned municipality. It is the largest gypsum processing company in the city's industrial hub. The research sample consisted of 67 workers who are regularly active in the factory, in any of its sectors. This number was obtained through random sampling calculation, simple and without replacement, ensuring a satisfactory result.

The inclusion criteria were as follows: employees who work regularly in any sector of the company and those who had a medical certificate due to work-related causes. Workers under the age of 18 years old were excluded, in addition to those who were recently hired by the company.

Data collection was preceded by a formal presentation with the workers in the morning about the study in question, in which the research objectives, the procedures for applying the data collection instrument and the FICF were addressed.

The instrument used was a semi-structured questionnaire with open and closed questions, comprised by six stages. The first stage consisted in questions referring to the sociodemographic data. The second was about occupational aspects, such as working time, activity performed in the company, if this activity was exhausting or uncomfortable, if they had already suffered any work-related accident and if it was reported, if they received

assistance after the work-related accident and if they developed any disease related to the activity performed.

The third stage included questions related to the life habits. The fourth dealt with the health status, such as diseases before and after joining the industry, as well as the overall health status according to the respondents' perception, whether they were periodically examined, and the prevalent diseases in these workers. The fifth stage consisted of questions regarding the use of Personal Protective Equipment (PPE); and the sixth and final stage dealt with questions about whether there were Occupational Nursing actions in the company and how these activities were carried out.

Data collection was in charge of the researchers and was carried out after the workers agreed to participate in the research, which was with the presence of a professional from the company in the sectors of the factory itself and in the cafeteria at lunchtime.

After surveying the information, the data were organized and tabulated in Microsoft Excel, version 2019. Descriptive analysis was performed, and the results were presented by means of simple and absolute frequency values, arranged in tables and graphs.

This research was approved by the Research Ethics Committee under opinion No. 2,677,507.

RESULTS

The sample of this study consisted of 67 workers from a gypsum processing factory, 63 of them being male (94%). Regarding the age group, 27 (40.3%) were between 21 and 30 years old; followed by 18 (26.9%) between 31 and 40 years old; 15 (22.4%) between 41 and 50 years old; six (9%) between 51 and 60 years old; and one (1.5%) aged up to 20 years old. The most frequent marital status corresponded to married individuals, with 36 (53.7%), and 18 (26.9%) in stable unions. Regarding skin color, 44 (65.7%) self-declared as brown-skinned; 15 (22.4%) as black-skinned; six (8.9%) as white-skinned; and two (3%) as Asians.

It was observed that 34 (50.7%) had complete elementary school, 18 (26.9%) had incomplete elementary school, 10 (14.9%) had complete high school, four (6%) were illiterate and one (1.5%) had complete higher education. Regarding family income, 44 (65.7%) earned from two to three minimum wages, followed by 13 (19.4%) with more than three minimum wages and 10 (14.9%) who earned up to one minimum wage.

In relation to the tasks developed by the professionals in the factory, due to its large size, it was possible to notice certain diversification in these employees' functions. Those with the highest number of workers were as follows: 16 (23.9%) machine operators; 14 (20.9%) stowage; and 12 (17.9%) baggers. 21 (31.3%) of the interviewees worked directly in plaster production.

According to working time, the results show that most of the workers had between one and five years, with 29 (43.3%) of the workers, followed by 17 (25.4%) between six and 10 years; 12 (17.9%) less than one year; and nine (13.4%) with more than 10 years. When asked about the frequency with which work is performed in uncomfortable positions, 22 (32.8%) stated that they always work in uncomfortable positions; and 19 (28.4%) indicated that they often work in uncomfortable positions. Regarding the wear out resulting from the work activity, 37 (55.2%) of the workers asserted that it is very weary.

Of the sample studied, three (4.5%) employees stated having already suffered work-related accidents, being characterized as slight and blunt injuries by the workers themselves. When asked about notification of the accidents, all (100%) workers stated that they had been notified, of which two (66.7%) reported having received assistance after the accident.

Six (9%) workers presented work-related diseases. Of these, five (83.3%) were not reported. Regarding guidance by a health professionals, all six (100%) workers reported having received assistance (Table 1).

Table 1 - Occupational aspects of the workers from the plaster factory. Grajaú, MA, Brazil, 2018 (continues)

Occupational Aspects	No.	%
Time in the activity		
Less than 1 year	12	17,9
1 - 5 years	29	43,3
6 - 10 years	17	25,4
More than 10 years	9	13,4
Type of job		
Administrative	7	10,5
Direct plaster production	21	31,3
Other	39	58,2
Working in uncomfortable positions		
No	10	14,9
Rarely	16	23,9
Frequently	19	28,4
Always	22	32,8
Physically exhausting activity		
No	8	12
A little	22	32,8
Very	37	55,2
Work-related accident		
Yes ¹	3	4,5
No	64	95,5
Work-related accident reported²		
Yes	3	100
Welcoming after work-related accident²		
Yes	2	66,7
No	1	33,3
Work-related diseases³		
Yes	6	9
No	61	91
Work-related disease reported⁴		
Yes	1	16,7
No	5	83,3

Guidance by health professional after the disease⁴

Yes	6	100
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Key: 1Work-related accidents: slight and blunt injuries. 2Only for workers who suffered work-related accidents. 3Work-related diseases: allergy and herniated disks. 4Only for workers who reported work-related diseases. Source: Research data (2018).

Regarding the life habits related to workers' health, it was verified that 52 (77.6%) were non-smokers; nine (13.4%) were former smokers; and only six (9%) smoked. However, 40 (59.7%) drank alcohol and 42 (62.7%) did not practice any physical activity regularly; only 15 (22.4%) of the interviewees practice physical activities from three to four times a week.

As for the occurrence of health problems prior to working in the factory and the acquired health problems that they currently present, only one (1.5%) employee reported having a pathology prior to work. In relation to the current health problems, 10 (14.9%) of the workers stated that they had health problems, such as herniated discs, low back pain, allergy, anxiety and Systemic Arterial Hypertension (SAH). When asked about the perception about their health status, 40 (59.7%) described it as good; 14 (20.9%), as very good; and 13 (19.4%), as fair.

It was noticed that 50 (74.6%) of the interviewees do not undergo health exams periodically. Among the workers interviewed, the following was obtained in relation to undergoing laboratory tests periodically: 15 (88.2%) for hemograms; 13 (76.5%) for glycaemia; seven (42.2%) for urine exams; one (5.9%) for chest X-ray; and one (5.9%) for other exams.

Sixty-four (97%) of the workers stated not having any chronic disease. Of those who answered, only two (3%) reported SAH. The most frequent work-related symptoms were as follows: 19 (28.4%), irritation in the eyes; 17 (25.4%), irritation on the skin; 15 (22.4%), pain in the joints; nine (13.4%), irritation in the nasal mucosa; and seven (10.4%), respiratory problems.

In Figure 1, when showing the prevalent symptoms according to the time of occupational exposure, it is possible to see that complaints such as irritation in the eyes increased with working time. The other complaints were variable over time; however, they were always present in a percentage of workers regardless of the exposure time, except for the complaint related to irritation in the nasal mucosa, which was not reported by the workers with more than six years of working time.

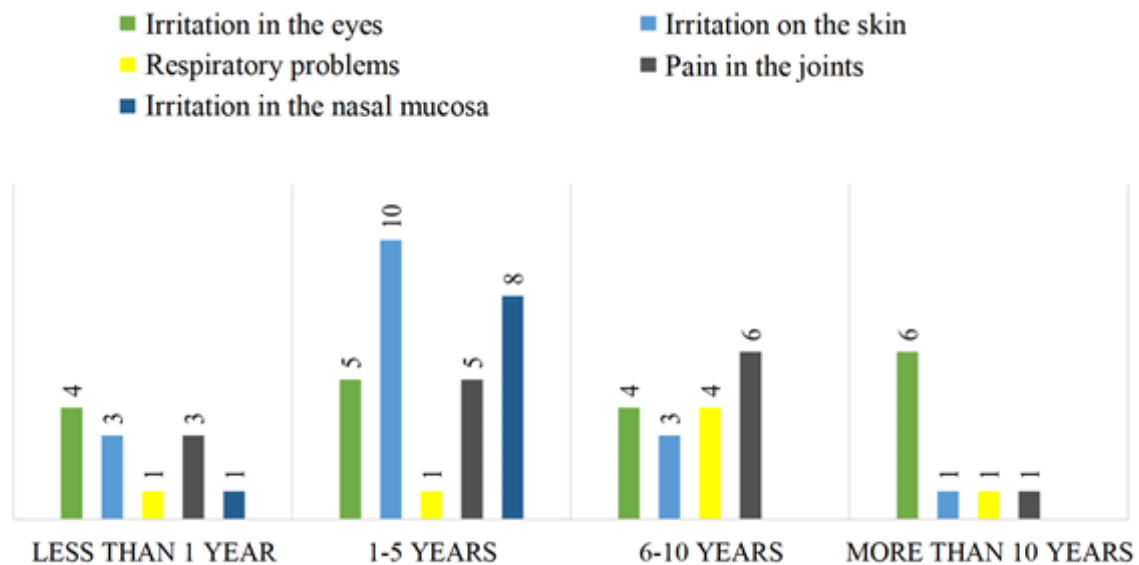


Figure 1 - Prevalent symptoms according to the time of professional experience of the workers from the plaster factory. Grajaú, MA, Brazil, 2018. Source: The authors (2018).

Regarding the workers' knowledge about PPE items, the majority (66; 98.5%) stated being aware of the topic and 64 (95.5%) indicated that they used PPE items. Regarding the company's training on the use of PPE, 24 (35.8%) of the workers answered that the training was carried out every six months; 38 (56.7%) stated that it was carried out once a year and five (7.5%) admitted that they had not received any training on the use of PPE. When asked about supervision regarding PPE use, 66 (98.5%) of the workers stated that the company implements constant and periodic supervision or monitoring actions.

When asked about the performance of the health team in the company, 51 (76.1%) of the workers stated that the performance of the Nursing team was positive, and 16 (23.9%) of them admitted that there was no action by the health team. It can be seen that 53 (79.1%) of the research participants attested that the health education activities were carried out in the work environment, while 14 (20.9%) stated that they were not implemented.

Figure 2, which shows the topics addressed in the health education activities, points to the topic of Sexually Transmitted Infections (STIs) as the most frequently addressed. The topics of occupational health and safety at work were mentioned by five (9.4%) and one (1.9%) of the workers, respectively, even though they are topics of paramount importance in the plaster factory. According to the results obtained in the research, the topics portrayed in the health education actions implemented in the plaster factory are still considered as limited.

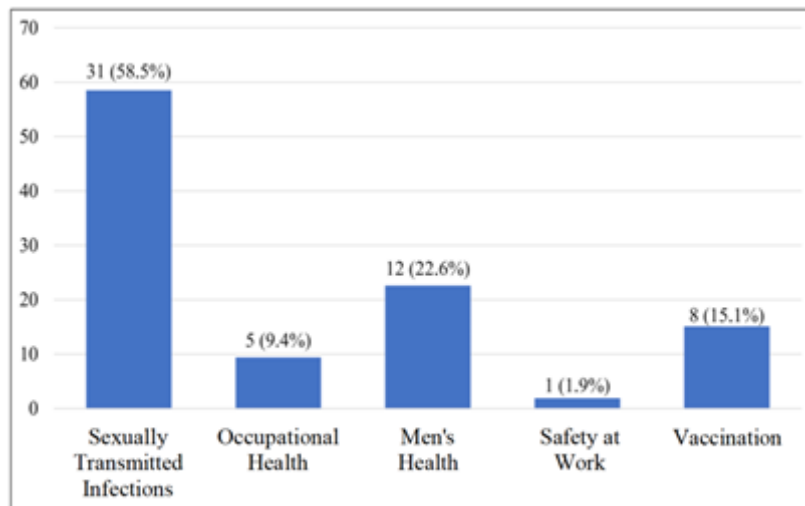


Figure 2 - Topics addressed in the health education actions implemented in the plaster factory. Grajaú, MA, Brazil, 2018. Source: The authors (2018).

DISCUSSION

The sample of this study consisted of 67 workers from a gypsum processing factory, with prevalence of the male gender. According to a survey carried out in 2017 with an approach to working women's work⁶, the professions that require physical strength and heavy work, performed in inhospitable, dirty and unhealthy environments, are usually associated with male stereotypes, while femininity is associated with light, easy and clean work, which requires patience and detail.

In relation to marital status, it was noticed that most of them stated being married. Marital life is associated with health and with quality of life. On the other hand, absence of a spouse and marital dissatisfaction can be potentiating factors for mental illness, at the same time that they can cause somatization of physical origin⁷.

Based on the results, it can be seen that work in the plaster factory is somewhat constant, with most workers performing their duties for several years, becoming susceptible to occupational diseases. The reasons that favor illness at work are mainly related to the absence of training for a safe practice of their functions. There are other factors in addition to the aforementioned, such as the working conditions, repetitive movements, and accelerated work pace to attain production goals⁸.

In this paper, the results show that most of the factory's workers perform their tasks in uncomfortable positions at some or other moment. The work process is directly related to the health-disease process, as adverse conditions in the work environment can lead to diseases and health problems, such as RSI/WRMD, for example⁹.

According to the results, it noticed that a small percentage of the workers stated having already suffered work-related accidents. An observational study carried out between 2007 and 2015 in a metalworking industry revealed that, among the MEAN of 1,277 employees in the period, 437 workers were victims of work-related accidents¹⁰.

When correlating the research results with the diverse scientific evidence, it can be seen that work-related accidents present a number well below the expected. In order to minimize or stop the occurrence of work-related accidents, it is necessary to have both an adequate environment to carry out the tasks and a safety culture, in which all those involved are aware of the risks and dangers to which they are subjected in the work environment¹¹.

The work-related diseases mentioned were the following: allergy and herniated disks. According to a study carried out in the context of the plaster production complex of Araripe-CE, it was found that plaster dust has an impact on people's health, exerting an irritating action on the mucous membrane of the respiratory tract and eyes, triggering affections, reaching 30% of the hospitalization cases caused by respiratory problems in the region¹².

Regarding the life habits, the number of smokers presented low percentages. In relation to alcohol, most of the workers (59.7%) stated drinking alcoholic beverages. The practice of drinking alcoholic beverages has caused substantial risks and, eventually, harms to the individuals' body, including intoxication and physical or psychological dependence. In addition to that, it can affect the social and work relationships, representing a serious problem for many societies in the world¹³.

Regarding the practice of physical activity, most of the interviewees stated not practicing physical exercises. A research study carried out in the 27 Brazilian capital cities states that a frequency of physical activity of 150 minutes of moderate activity a week was 41.5%, with a higher value among men (48.7%)¹⁴. Thus, considering the data contained in the literature, the practice of physical exercise by the workers from the plaster processing factory is below the national mean.

It was noticed that a percentage of the workers stated having problems such as herniated disks, low back pain, allergy, anxiety and SAH. In a study carried out in a metallurgical industry in the inland of São Paulo, 23.6% of the total of 182 workers presented morbidities such as SAH, high cholesterol, spinal disorders, RSI and gastritis, corroborating some results obtained in this research¹⁵.

When asked about how they perceive their health status, 13 (19.4%) considered it as fair. In a survey carried out in 27 cities, it was observed that 2.8% of the people rated their health status negatively, and the frequency of this condition was reduced with the increase in schooling¹⁴.

Among the workers interviewed, a low percentage was obtained in relation to undergoing laboratory tests: only 17 (25.4%) did so periodically; which differs from a survey carried out with 200 workers in a city from the inland of the state of São Paulo. Regarding medical appointments, the majority (85.7%) of the interviewees answered affirmatively that they underwent periodic medical exams at the company¹⁵. In the data obtained, the number of workers that undergo periodic exams is minimal and, consequently, they present a high probability of illness.

Herniated disks, low back pain and pain in the joints were observed among the diseases and symptoms reported by the workers. This result corroborated those of a study that used data from the National Household Sample Survey (Pesquisa Nacional por Amostra de Domicílios, PNAD), which resulted in spinal diseases (OR=1.42), SAH (OR=1.35) and rheumatism (OR=1.79) as those most likely to be acquired among these workers¹⁶.

The diseases and symptoms presented in the results of this research are directly related to the type of services provided by the workers in the plaster factory, most of which are exhausting and require physical strength. Considering that the workers present pain in the joints, this factor is associated with inadequate ergonomics in the work process¹⁷.

According to the results, the predominant work-related symptoms were the following: irritation in the eyes; irritation on the skin; pain in the joints; irritation in the nasal mucosa; and respiratory problems. Confirming the results obtained in this research, a study carried out in the municipality of Araripina, which is part of the plaster production hub of Pernambuco, Brazil, pointed out that, in the population studied, the prevalent health problems were as follows: irritation in the eyes (42.92%); nose bleeding (37.39%); cough (28.26%); tiredness (21.73%); irritation on the skin (18.48%); shortness of breath (16.26%) and history of previous respiratory diseases (16.34%), all statistically significant¹¹.

When exploring the data, a relative association was perceived between the complaints and working time. This fact can be related to the workers' exposure to plaster dust which, despite being inert and having low fibrogenic potential, can cause pneumoconiosis, a consequence of long-term occupational exposure in mining and related works, which may also lead to diagnoses of tuberculosis and bronchiolitis, among others¹⁸. Few studies address the impacts on the population exposed to plaster dust, contributing to an unfavorable situation for these workers' safety and health¹¹.

In the work environment of these workers, PPE use is of utmost importance to prevent work-related accidents and occupational diseases. In a survey carried out with 31 employees of a metallurgical plant, it was found (according to the exposure of each sector) that 25 (80.6%) employees use the necessary PPE, while six (19.4%) do not do so, even if considered essential to the practice of their functions¹⁹.

In another survey carried out with 142 construction workers, when asked if they had already stopped using any PPE item, either due to discomfort or because it affected their productivity, almost 50% of the interviewees answered affirmatively, that is to say, they had stopped using the equipment at some moment²⁰.

The results on PPE knowledge and use by the workers were satisfactory, although worrying, as a small part of those who know about PPE stated using it. Although this percentage is considered minimal, it points to a failure in the permanent education process, such as training and supervision in the work environment. And when we correlate the PPE items commonly used by workers with the occupational diseases found in the plaster factory, we can deduce that the PPE items that protect against these pathologies were the least used by the workers.

When asked about the performance of the health team, the data show certain discrepancy between the workers' answers about such performance in the plaster processing factory, as a considerable percentage of the workers stated that there was no action by the health professionals in the work environment.

In this sense, education in health is an activity to be developed by health professionals, among them nurses, who are the main actors in care, establishing a dialogic-reflective relationship between professional and client, aiming at raising awareness of their health and perception as active participants in the transformation of their own life²¹.

As for the recurring themes in health education activities, regarding vaccination, it was observed that despite being an important prevention measure, when we talk about Collective Health, only a small percentage admitted to approaching this theme. According to the National Association of Occupational Medicine (Associação Nacional de Medicina do Trabalho, ANAMT), infectious diseases are perceived as a problem to which workers in various activities are exposed and, some of them, as causing socioeconomic damage to companies. Therefore, vaccination should be included among the topics to be worked on throughout the year²².

The following stand out as limitations of this study: the sample size and the fact that there is a single plaster production complex in the municipality, which hinders generalization of the results. Finally, as the questionnaires were applied in the company's premises, the time for the answers was shorter.

CONCLUSION

The study allowed assessing the prevalent occupational diseases and symptoms in the workers from a plaster production complex. The results show that most of the interviewees were male, aged between 21 and 30 years old, married, brown-skinned, with

complete elementary school and incomes from two to three minimum wages. In relation to the activities performed in the complex, there was prevalence of machine operators, with working times from one to five years. In relation to the life habits, it was found that most of them were non-smokers; however, a significant percentage drank alcoholic beverages, did not practice physical activity and did not undergo periodic health exams. A small percentage stated having health problems such as herniated disks, allergy, anxiety and SAH.

A reduced part of the sample indicated having had some work-related disease. The most frequent work-related symptoms were the following: irritation in the eyes; irritation on the skin; pain in the joints; irritation in the nasal mucosa; and respiratory problems.

Through the results, it is expected to intensify the work of Occupational Nursing in the face of education in health for workers from the plaster production complex, both on the risks to which they are exposed and on the importance of using PPE items to reduce the number of health problems. In this context, the importance of Occupational Nursing and of the health team working in the occupational environment is noticed, seeking to prevent work-related diseases and accidents and implementing actions to promote health and prolong the workers' life.

Above all, we highlight the contribution of the study by conferring visibility to the epidemiological situation of workers in the context of a plaster production hub and warning the local managers about the indispensability of developing actions in health and safety at work, such as measures to prevent accidents, especially in high-risk positions. These results can provide indicators to be used as a parameter to support decision-making regarding public policies aimed at workers' health, in the context of gypsum mining.

REFERENCES

1. Scomparim M. A eficácia da redução da jornada laboral como forma de viabilizar o surgimento de novos postos de trabalho. Revista Eletrônica de Graduação do UNIVEM [Internet]. 2009 [accessed 19 fev 2019]; 1(1): 94-121. Available from: <https://revista.univem.edu.br/REGRAD/article/view/44/71#:~:text=Estudos%20apontam%20que%2C%20para%20gera%C3%A7%C3%A3o,de%20novos%20postos%20de%20trabalho>.
2. Lara R. Saúde do trabalhador: considerações a partir da crítica da economia política. R. Katál. [Internet]. 2011 [accessed 22 nov. 2017]; 14(1): 78-85. Available from: <https://www.scielo.br/j/rk/a/Czdx3sGRxBwP3QjS3Dvhnpp/?lang=pt>.
3. Cordeiro CFS. O beneficiamento do gesso e seus impactos na saúde do trabalhador [Monografia]. Grajaú (MA): Universidade Estadual do Maranhão; 2013.
4. Presidência da República Casa Civil (BR). Decreto nº 7.602, de 7 de novembro de 2011: dispõe sobre a Política Nacional de Segurança e Saúde no Trabalho - PNSST. Diário Oficial da União, [Internet]. 08 nov 2011 [accessed 15 out 2017]. Available from: https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/policy/wcms_212109.pdf.
5. Lima CRR. Conhecimento dos trabalhadores de uma fábrica de gesso de Grajaú/MA sobre a importância do uso de equipamentos de proteção individual [Monografia]. Grajaú (MA): Universidade Estadual do Maranhão; 2013.
6. Rosa M, Quirino R. Relações de gênero e ergonomia: abordagem do trabalho da mulher operária. Holos [Internet]. 2017 [accessed 08 jan 2019]; 5: 345-359. Available from: <https://www2.ifrn.edu.br/ojs/index.php/HOLOS/article/view/4772>.
7. Scorsolini-Comin F, Santos MA dos. Satisfação conjugal: revisão integrativa da literatura científica

- nacional. *Psicol: Teoria Pesq.* [Internet]. 2010 [accessed 09 jan 2019]; 26(3): 525-31. Available from: <https://www.scielo.br/j/ptp/a/kCzSN6Jhxj36NKtxBbtXh7n/abstract/?lang=pt>.
8. Franco-Benatti D de M, Navarro VL. Acidentes de trabalho como forma de violência: estudo com trabalhadores da indústria de calçados de Franca (SP). In: VIII Seminário de Saúde do Trabalhador; 2012 Set. p. 1-17; Franca, Brasil. Franca: UNESP; 2012 [accessed 08 jan 2019]. Available from: http://www.proceedings.scielo.br/scielo.php?pid=MSC0000000112012000100017&script=sci_arttext.
9. Rios MA, Vilela ABA, Nery AA. O trabalho e a saúde de açougueiros idosos: relato de casos em um mercado municipal. *Rev. bras. geriatr. gerontol.* [Internet]. 2017 [accessed 14 jan 2019]; 20(5): 643-649. Available from: <https://www.scielo.br/j/rbagg/a/x7f98yXGm8xJy7cJjYQgYHR/?lang=pt&format=pdf>.
10. Gonçalves SBB, Sakae TM, Magajewski FL. Prevalência e fatores associados aos acidentes de trabalho em uma indústria metalmeccânica. *Rev Bras Med Trab.* [Internet]. 2018 [accessed 10 jan 2019]; 16(1): 26-35. Available from: [https://www.rbmt.org.br/details/290/pt-BR/prevalencia-e-fatores-associados-aos-acidentes-de-trabalho-em-uma-industria-metalmeccanica#:~:text=Um%20estudo%20analizando%20os%20AT,manuais%20\(15%2C3%25\)](https://www.rbmt.org.br/details/290/pt-BR/prevalencia-e-fatores-associados-aos-acidentes-de-trabalho-em-uma-industria-metalmeccanica#:~:text=Um%20estudo%20analizando%20os%20AT,manuais%20(15%2C3%25)).
11. Coltre JC. Segurança e saúde no trabalho: a prevenção de acidentes na construção civil [Monografia]. Campo Mourão (PR): Universidade Tecnológica Federal do Paraná; 2011 [accessed 12 jan 2019]. 65 p. Available from: http://repositorio.utfpr.edu.br/jspui/bitstream/1/5613/2/CM_COMAC_2011_2_01.pdf.
12. Medeiros MS de, Hurtado-Guerrero JC, Silva LGA. A saúde no contexto do polo gesseiro de Araripina-Pernambuco, Brasil. *Saude soc.* [Internet]. 2010 [accessed 27 ago 2017]; 19(2): 358-370. Available from: <https://www.scielo.br/j/sausoc/a/gM73RD6RSXxKxCpSS4S8PfM/abstract/?lang=pt>.
13. Magallón T de JC, Robazzi ML do CC. Consumo de álcool en trabajadores de una industria en Monterrey, México. *Rev. Latino-Am. Enfermagem* [Internet]. 2005 [accessed 29 jan 2019]; 13(spe): 819-826. Available from: <https://www.scielo.br/j/rlae/a/DsVKJyV6jWNFnfLrgsbbSm/?lang=es>.
14. Ministério da Saúde (BR). *Vigitel Brasil 2017 Saúde Suplementar: vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico* [Internet] Brasília: Ministério da Saúde; 2018 [aceso em 11 jan 2019]. Available from: https://bvsmms.saude.gov.br/bvs/publicacoes/vigitel_brasil_2017_vigilancia_fatores_riscos.pdf.
15. Battaus MRB, Monteiro MI. Perfil sociodemográfico e estilo de vida de trabalhadores de uma indústria metalúrgica. *Rev. bras. enferm.* [Internet]. 2013 [accessed 11 jan 2019]; 66(1): 52-58. Available from: <https://www.scielo.br/j/reben/a/brLhJyYbtMZmZMGmqZbD94t/?lang=pt>.
16. Moreira JP de L, Oliveira BLCA de, Muzi CD, Cunha CLF, Brito A dos S, Luiz RR. A saúde dos trabalhadores da atividade rural no Brasil. *Cad. Saúde Pública* [Internet]. 2015 [accessed 12 jan 2019]; 31(8): 1698-1708. Available from: <https://www.scielo.br/j/csp/a/Wx9jvYXjQsLZRYhGsMw6S8D/?lang=pt>.
17. Picoloto D, Silveira E da. Prevalência de sintomas osteomusculares e fatores associados em trabalhadores de uma indústria metalúrgica de Canoas - RS. *Ciênc. saúde coletiva* [Internet]. 2008 [accessed 12 jan 2019]; 13(2): 507-516. Available from: <https://www.scielo.br/j/csc/a/hhWbqyS95Mz8PwQhGdG4jFz/?lang=pt>.
18. Severo EMF, Sousa HJC de. Estruturação de modelo para avaliação dos riscos decorrentes da exposição do trabalhador à poeira do gesso. In: 6 Congresso Ibero-Americano en investigación cualitativa; 2017 Jul. p. 1136-144; Salamanca, Espanha. [Internet] Salamanca: ESALQ; 2017 [accessed 15 jan 2019]. Available from: <https://proceedings.ciaiq.org/index.php/ciaiq2017/article/download/1450/1407/#:~:text=O%20objetivo%20deste%20estudo%20%C3%A9,nas%20normas%20t%C3%A9cnicas%20e%20n.a>
19. Macedo VS, Bazzo KO, Crippa LB. Avaliação dos efeitos biológicos da exposição a toxicantes em trabalhadores de uma metalúrgica de Caxias do Sul, RS. *Rev Bras Med Trab.* [Internet]. 2018 [accessed 13 jan 2019]; 16(2): 175-84. Available from: <https://www.rbmt.org.br/details/313/pt-BR/avaliacao-dos-efeitos-biologicos-da-exposicao-a-toxicantes-em-trabalhadores-de-uma-metalurgica-de-caxias-do-sul--rs>.

20. Martins PHC. Estudo sobre a relação de conscientização do uso de epi's e o número de acidentes na construção civil [Monografia]. Maringá (PR): Centro Universitário De Maringá; 2017. [accessed 12 jan 2019]. Available from: <http://rdu.unicesumar.edu.br/bitstream/123456789/315/1/Pedro%20Henrique%20Canassa%20Martins.pdf>.
21. Sousa LB de, Torres CA, Pinheiro PN da C, Pinheiro AKB. Práticas de educação em saúde no Brasil: a atuação da enfermagem. Rev Enferm UERJ. [Internet]. 2010 [accessed 14 jan 2019]; 18(1):55-60. Available from: <https://pesquisa.bvsalud.org/portal/resource/pt/bde-18402>.
22. Gomes A, Ballalai I, Moura MM de, Azevedo P, Kfourir R de A, Angerami RN. Atualização em vacinação ocupacional: guia prático. Belo Horizonte: SBlm; ANAMT; 2007 [accessed 12 jan 2019]. Available from: http://www.anamt.org.br/site/upload_arquivos/sugestoes_de_leitura_171220131126567055475.pdf.

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Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - Fernandes A de S; Drafting the work or revising it critically for important intellectual content - Almeida LMN de, Carvalho PB, Martins LNL; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - Pereira E dos S, Silva WC da. All authors approved the final version of the text.

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