ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 10, Issue, 10, pp. 41130-41135, October, 2020
https://doi.org/10.37118/ijdr.20244.10.2020

RESEARCH ARTICLE OPEN ACCESS

HEALTH WORKERS OCCUPATIONAL ACCIDENTS EVALUATION: A HISTORICAL SERIES

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ARTICLE INFO

Article History:
Received 14th July, 2020
Received in revised form
20th August, 2020
Accepted 27th September, 2020
Published online 24th October, 2020

Key Words:
Occupational Accidents; Health Personnel; Occupational Health.

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ABSTRACT

Objective: to analyze the historical series of occupational accidents occurrence to health personnel in a city from the southern region of Minas Gerais, Brazil. Method: this is a descriptive, historical series exploratory, with quantitative approach, developed through Observatório de Saúde e Segurança do Trabalho data, from TrabalhoDecenteSmartLab platform, for the southern region of Minas Gerais city, Brazil. The studied population was all the healthcare workers who suffered work accidents from 2002 to 2018. The data from SmartLab platform from 2002 to 2018 were used as a collection instrument. Results: the historical series showed a considerable elevation of occupational accidents notifications from 2007 to 2014 and a mitigation in the following years, with a posterior increase in 2018. Auxiliaries, medical technicians and nurses were the most affected by accidents. Exogenous intoxication and exposure to biological material were the most notified types of accidents. The injuries that most affected these professionals were cuts, lacerations and contusion wounds, attaining mainly their fingers and eyes. Conclusion: work accidents are always present in health personnel's working environment. For this reason, actions must be implemented to promote more safety to workers at their workplace.

Citation: ***Renilda da Penha Leite Queiroz, Leticia Aparecida Brito Santini, Ana Flávia dos Reis Neiva, Jony Pimenta de Vasconcelos Neto, Policardo Gonçalves da Silva and Sérgio Valverde Marques dos Santos,* 2020**. *"Health workers occupational accidents evaluation: a historical series"*, International *Journal of Development Research*, 10, (10), 41130-41135.

INTRODUCTION

The occupational accidents are one of the main causes of working days and productivity losses. In the world, 337 million accidents occur annually on average, what indicates that approximately 923 workers are attained per day. In the economical field the costs are extraordinary, overcoming the mark of one trillion dollars a year that represents an average of 4% of global Gross Domestic Product (GDP) (SÁ *et al*, 2016). Brazil is one of the champions on occupational accidents, being the world's fourth position on fatal injuries, after China, India and Indonesia. In 2011, Brazil spent on average R$71 billion on accidents occurrence that amounts to 9% of all national payroll (SÁ *et al*, 2016). Minas Gerais State, which is in Brazil's southeastern region, was the second state of the country with the largest number of deaths by work accidents in 2013 (GUERSON *et al*, 2016).

The increase of occupational accidents number is present in many work environments. In terms of hospital field, many times accidents are related to the use of sharp objects, aside from incorrect disposal of used materials, which can affect other workers. Many professionals have been mechanized about the service guidelines, with that there's more and more increase of occupational accidents at work places (MELO *et al*, 2017). There are many work processes of health personnel, in which there is always exposure to occupational risks due to direct and indirect assistance activities to patients. Some professionals carry out janitorial care, disinfection and material and hospital equipment sterilization, counting as the most risk to occupational accidents class on hospital environment (SANTOS JUNIOR *et al*, 2014). Other questions also collaborate to work accident occurrence to health personnel, among them there are inexperience, lack of safety

equipment, fatigue, double work day and emotional disorders. Beyond that, there are in addition selfconfidence excess, disorganized service, shift work, emotional imbalance in emergency situations and high complexity technologies (SANTOS JUNIOR *et al*, 2014). The injured worker, besides suffering due to the physical injury, or even losing its life, can be susceptible to psychological damage in many times irreversible. These accidents may bring about sequels to the professional, making it unable to exert its working activities temporarily or permanently. Aside that, there is the possibility of causing limitations, incapabilities, diseases and disruption of worker's day by day activities, including implications to development of household routines and leisure time (CAVALCANTE *et al*, 2015). Other issues pointed out by health sector and human sciences researchers about work environment risk are the feelings of fear of accidents and of guilt for them. Those feelings psychologically undermine personnel who have risk situations at their working place, which causes in turn the failure to notify the accidents (CAVALCANTE *et al*, 2015). Studies have evidenced that most accidents suffered by health personnel are related to needles in venepuncture activities, subcutaneous medicine administration and serotherapy, followed by the ones related to inadequately disposed needles by other workers (SANTOS JUNIOR *et al*, 2014). Another inquiry highlighted that many professionals do not adopt preventive measures to decrease occupational accidents (NAZÁRIO; COMPONOGARA; DIAS, 2017). In this context, nursing professionals are the ones who suffer most from occupational accidents, whereas in some sectors the assistance procedures are this team's responsibility (FREITAS *et al*, 2019). Therefore, it is noticeable the importance of inquiring occupational accidents suffered by health personnel, since it may entail physical and mental consequences to workers and damage the quality of assisting users. Thus, this justifies the requirement of promoting a better knowledge about these occurrences among health professionals due to the limitation of studies which approach this theme in cities of the southern region of Minas Gerais, Brazil. Thereby, the aim of this research is to analyze the health personnel's occupational accidents historical series in a city from the southern region of Minas Gerais, Brazil.

MATERIAL AND METHOD

Outline of the study: Descriptive, exploratory of historical series with quantitative approach, developed through Observatório de Saúde e Segurança do Trabalho data, from TrabalhoDecenteSmartLab platform, for the southern region of Minas Gerais city, Brazil. The Observatório de Saúde e Segurança do Trabalho was created by an initiative of TrabalhoDecenteSmartLab by researchers from Faculdade de SaúdePública da Universidade de São Paulo (USP), which use data from INSS - SUB/Concession, of CATWEB and of Ministry of Health - SINAN. It has as main objective to improve information to promote public policies of prevention of diseases and accidents related to work, not only nationally, but in each one of the 5.570 Brazilian cities (Observatório de Segurança e Saúde no Trabalho, 2020).

Place of study: The study was carried out through the SmartLab platform for the city of Passos, Minas Gerais, Brazil. This city was chosen for being part of the 20 cities of Minas Gerais with the largest numbers of occupational accidents, aside being one of the main cities of the southern region of Minas Gerais with largest records of occurrences.

Population of study: Initially, the population of study was all workers who suffered occupational accidents in Passos, from 2002 to 2018. Posteriorly, it was carried out a historical series analysis only about the accidents suffered by health personnel, between 2002 and 2018, in conformity to SmartLab data. It is estimated that there were approximately 8,232 occupational accidents in Passos, from 2002 to 2018.

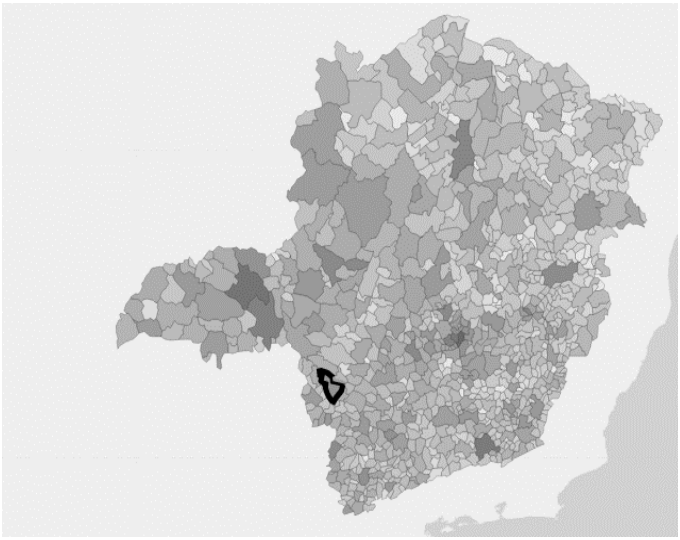
Instruments and procedures to data collection: As collection instrument, it was used information from SmartLab platform by Observatório de Saúde e Segurança do Trabalho available from 2002 to 2018. In some moments data between 2002 and 2018 and between 2012 and 2018 were evaluated according to availability of variables. The perspective of occupational accidents frequency allows the identification of quantitative evolution of records in absolute numbers in different time spans due to examination of the historical series and of the geographic distribution of occurrences. The reviews were carried out from several quantitative divisions, in which were presented analyzed data from different sources. The relative numbers and their coefficients were shown in distinct dimension, emphasizing prevalence and incidence. The data were collected from Instituto Brasileiro de Geografia e Estatística (IBGE), from AnuárioEstatístico da Previdência Social (AEPS), from AnuárioEstatístico de Acidentes de Trabalho (AEAT), from Sistema Único de Benefícios (SUB) and from Sistema Nacional de Agravos de Notificação (SINAN) (Observatório de Segurança e Saúde no Trabalho, 2020). The variables analyzed in the pertinent period were: geographic distribution of occupational accidents; notifications prevalence of occupational accidents; the injured workers' occupation at healthcare sector; notification frequency at healthcare sector; most frequent injuries; most attained body parts and causing agents groups.

Data analyses: The data were reviewed descriptively through historical series analysis with percentage, relative and absolute values, according to SmartLab platform availability.

Ethical aspects: In relation to ethical aspects, the secondary informations extracted from Observatório de Saúde e Segurança do Trabalho through SmartLab platform are in the public domain. Therefore, there's no need for data use authorization or either any Committee on Ethics in Research evaluation, as National Resolution 466/2012.

RESULTS

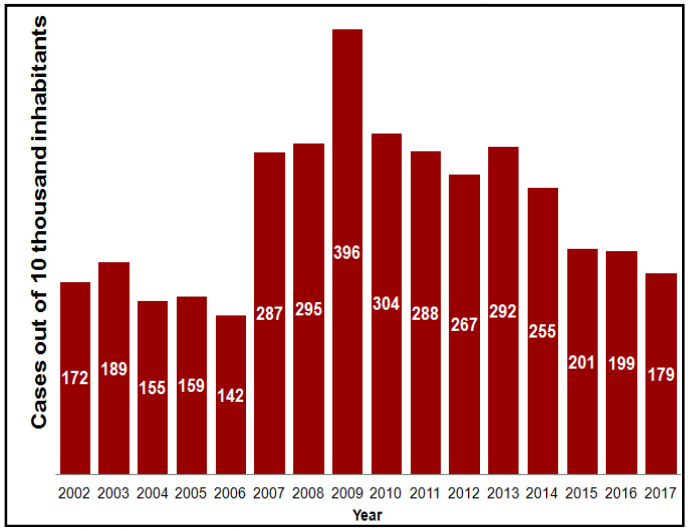
Figure 1 shows the geographic distribution of occupational accidents in Minas Gerais, emphasizing the city of Passos in 2018. When analyzing the geographic distribution of occupational accidents occured in Minas Gerais, It was possible to observe that the city of Passos is among the 20 cities with largest accidents number, taking 16th place with 552 accidents in 2018. In this period, 64.9 thousand accidents were recorded in Minas Gerais and 623.8 thousand in Brazil. When evaluating the historical evolution of occupational accidents notifications numbers between 2002 and 2018 in Passos, It was observed that there was a significant increase on them from 2007 to 2014 (507 - 621 accidents respectively) and a mitigation in the following years with posterior increase in 2018 (552 accidents). When comparing the historical series of the past decade, it was noted a 35% reduction on work accidents occurrence number.



Source: SmartLab, 2018.

Figure 1. Geographic distribution of occupational accidents Minas Gerais in 2018. Passos, MG, Brazil

The Figure 2 shows the occupational accidents notifications prevalence in the city of Passos from 2002 to 2017



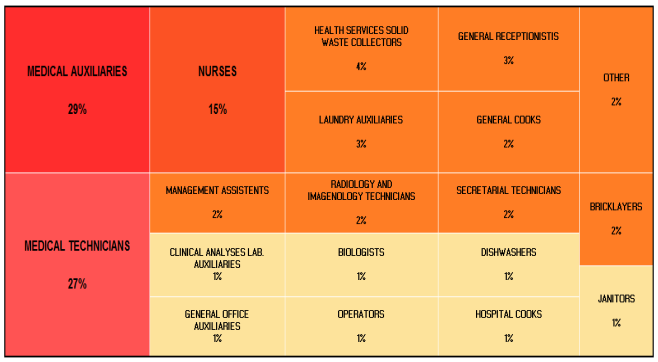
Source: data from SmartLab, 2018.

Figure 2. Occupational accidents notifications prevalence in the city of Passos from 2002 to 2017. Passos, MG, Brazil

The notifications number regarding the number of cases out of 10 thousand formal workers show a relevant increase from 2007, revealing the peak of cases in 2009. In the following years, until 2017, the numbers decreased, however they are still elevated. When observing the historical series from the past nine years (2009 to 2017), it's shown a reduction of 54.7% on cases number out of 10 thousand workers

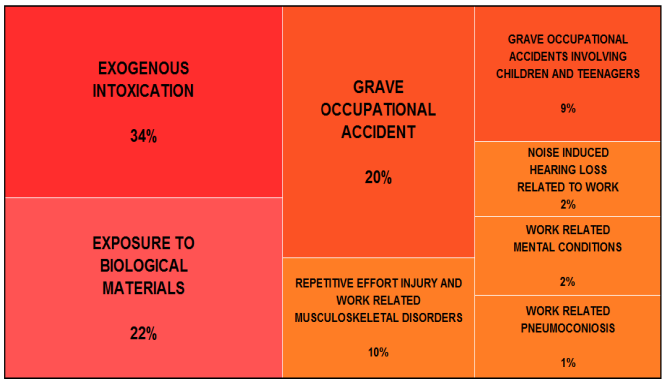
Figure 3 presents health personnel's occupational accidents in the hospital sector generally.

It was possible to observe that medical auxiliaries are the most afflicted by occupational accidents (29%), followed by medical technicians (27%) and nurses (15%). The other percentages are distributed among several professional categories from the hospital sector. The Figure 4 presents the occupational accidents notifications frequency among health personnel related to job activities according to illnesses and diseases in Passos from 2007 to 2018.



Source: data from SmartLab, 2018.

Figure 3. Occupations of work accident occurrence in hospital sectors in Passos from 2012 to 2018. Passos, MG, Brazil

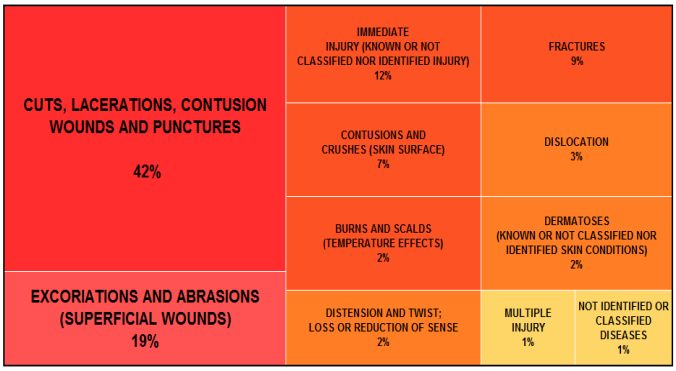


Source: data from SmartLab, 2018.

Figure 4. Occupational accidents notifications frequency among health personnel related to job activities according to illnesses and diseases in Passos from 2007 to 2018. Passos, MG, Brasil.

The Figure 4 shows data referring to work accidents types which have more notifications, with exogenous intoxication (34%), it means the contact to toxic products and materials. In the sequence, there are occupational accidents with exposure to biological materials (22%) which received the largest notifications number in the analyzed period. Posteriorly, there are the occupational accidents considered grave.

The Figure 5 presents the most frequent injuries in Passos among health personnel from 2012 to 2018.

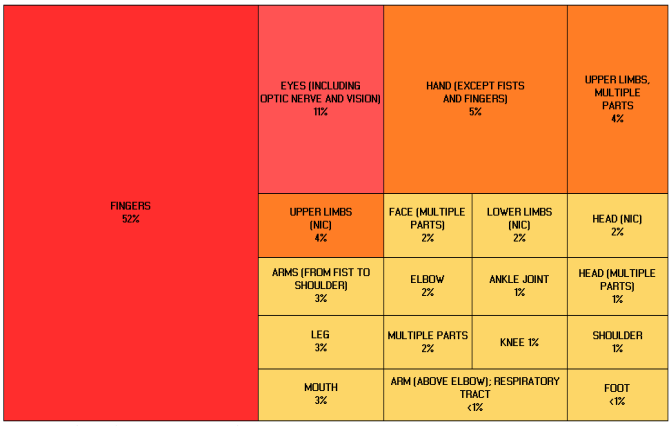


Source: data from SmartLab, 2018.

Figure 5. Most frequent injuries in Passos Among health personnel from 2012 to 2018. Passos, MG, Brazil

It was observed that the most frequent injuries which attain healthcare professionals were related to cuts, lacerations and contusion wounds (42%). The abrasions and excoriations, although they are slight injuries, represent 19% of

occurrences, followed by immediate lesions which correspond to 12% of occurrences. The Figure 6 shows which are the health personnel's body parts most attained by occupational accidents in Passos from 2012 to 2018.



Source: data from Smart Lab, 2018.

Figure 6. Most attained health personnel's body parts by occupational accidents in Passos from 2012 to 2018. Passos, MG, Brazil

The healthcare professionals' body part most affected by work accidents are the fingers (52%). Counting on 11% of notifications, there are the accidents involving eyes and, posterior, the accidents involving hands (5%). When analyzing the agents groups which mostly caused accidents in the healthcare sector in Passos from 2012 to 2018, it was observed that hand tools are the main accident-causing agents (48%). In sequence, there are the accidents caused by biological agents (18%) and, then, the accidents caused by chemical agents and transportation vehicles (8%). The fall on the same level is mentionable due to its high percentage (7%), followed by accidents with machines and equipments (5%), motorcycles (4%), furniture and accessories (2%) and fall from height (1%) according to SmartLab (2018).

DISCUSSION

When analyzing the geographic distribution of occupational accidents occurred in Minas Gerais, It was noted that Passos is among the 20 cities with the largest accidents number, 5.317 work accidents were recorded in the past 10 years (2009 to 2018). Brazil has approximately 700 thousand occupational accidents victims annually, with the largest rate of casualties due to work related accidents in the world. These statistics show how high the occurrence of occupational accidents is in the country (GUERSON *et al*, 2016). The city of Passos counts on a relevant number of carpentry shops. According to data from Centro de Referência a Saúde do Trabalhador (CEREST), the city has more than 230 carpentry shops among formal and informal ones. The city's epidemiological bulletin informs and alerts about the great number of accidents involving carpentry workers. The majority of the cases is grave and it is related to mutilations due to hand work and tools and equipment handling (FARIA; SANTOS; ABREU, 2017). The increase of the accidents number may be justified by the notification formalization on the part of the employer or the employee, by the economic development and by the supply of workforce in the region. This results in the qualified and non qualified services offer. Therefore when there is an increase in service offer, consequently, there will be more workers at risk and more work related accidents records (OLIVEIRA *et al*, 2015; FARIA; SANTOS; ABREU, 2017). It was also observed in this inquiry that the historical series of the past decade showed a reduction of 35% on occurrence of occupational accidents. When looking at the prevalence of work accidents occurrence in Passos out of 10 thousand inhabitants, it was noticeable a reduction of 54.7% on the number of notified cases. One of the hypotheses for the mitigation is the policies of work safety developed by companies, entailing the capacitating of their employees, once the regulation Orders in Council of work conditions demand programs to occupational accidents reduction from employers. The Ministry of Work established, through Order in Council n. 3.214 in 1978, 37 Regulatory Norms (NR) which must be complied in all labor sectors. This is primarily about the risks workers tackle at their workplace which can be physical, chemical, biological, ergonomic, psychosocial and accidental (SILVA *et al*, 2016).

Another reason for this issue can be the accidents underreporting. Literature data show that the accidents underreporting rates involving health personnel vary from 40% to 92% what reinforces the importance of analyzing the theme and the fragility of the current notification system (OLIVEIRA *et al*, 2015). The lack of notification entails great problems because, without the communication of some occupational accidents, those cases will not be included in statistics, engendering the underreporting and the inaccuracy of data needed to this problem management in the country and to public policies promotion (SÁ *Et al*, 2016). The underreporting remains as a challenge to worker's safety, for it hampers the acknowledgement of occupational accidents reality. Aside that there are many reasons alleged by nursing teams as justification to not doing this procedure, emphasizing underestimation of risk, procedure evaluation as unnecessary and lack of knowledge about adequate practice before notification and guidelines related to exposure to biological material, what highlights the importance of sensitizing these professionals (FREITAS *et al*, 2019). In relation to health personnel, these workers are exposed to several risk factors in their work environment. These factors can entail the occupational accidents occurrence. In Passos, the nursing professionals were the healthcare workers with the largest number of work accident cases.

The medical auxiliaries and technicians represent the largest number of occupational accident cases due to the greater charge of activities along with patients and to the lack of training, capacitation and actualization. Beside that, it is mentionable the low adhesion to standard precautions, the unawareness about risks, the inadequacy of physical mean, and the materials shortage in quantity and quality, aside the insufficient number of workers, engendering overload on the available ones (FREITAS *et al*, 2019). Another study proved that nurses are the working class which suffers most with occupational accidents, for in some sectors the practices for assistance of nurses are their own responsibility, such as in Intensive Care Unities (ICU). Therefore, the majority of procedures are ultimately their responsibility, mainly the invasive ones (FREITAS *et al*, 2019). In relation to the type of notification of health personnel accidents, exogenous intoxication and exposure to biological materials received the largest number of notifications. In the context of exposure to biological material there are the institutions which provide health services (hospitals, laboratories, dental practice offices, among others). The professionals who work in these sectors

are at constant risk of exposure to biological material. Biological risks are the main causes of danger and insalubrities in nursing teams work. This is one of the main categories subject to exposure to biological material. This exposure occurs when workers come in direct contact with patients, continuously, to execution of procedures that involve simple medication to direct contact with biological materials (OLIVEIRA *et al*, 2015). Exogenous intoxication can be defined as the clinical and/or biochemical consequence of exposure to chemical substances found in the environment or isolated. Environmental intoxicating substances can be found such as water, air, food, plants and venomous animals poison. The injured worker, aside suffering due to the injury or intoxication, can be subject to physical and psychological damage, which are irreversible in many times (CAVALCANTE *et al*., 2015). In relation to lesions in health personnel, cuts, lacerations and contusion wounds were the most frequent ones. There are many accidents that occur slightly, like superficial cuts without grave factors in many times due to lack of training and hygiene. Bad conditions of the labor environment, inadequate machines and equipments, lack of protection and specific training and insufficient investment funds on hygiene, safety and work medicine are responsible for occupational accidents in hospital environments (ANDERSSON, 1991).

Professionals' body parts most attained by occupational accidents were fingers and eyes. When referring to work accidents-causing agents groups among health care workers, hand tools and biological agents were the most recorded. Literature shows that emergency services and surgical centers are the places where frequently the largest indexes of occupational accidents due to exposure to biological material on health personnel occur. Beyond that, in these sectors procedures are executed with constant handling of cutting and penetrating instruments (SANTOS JUNIOR *et al*, 2014). The high rate of accidents caused by these agents occur due to the lack of training or even of qualified personnel such as a nurse or a work safety technician in the majority of cases. This professional must analyze the work environment aiming for the elimination of possible risks and the prevention of illnesses and diseases. Nurses beget responsible for the greatest part of patients interaction, however the safety responsibility to them about prevention of work related accidents equals to any other professional (PADOVEZE, 2012). Occupational nurses have a wide role inside organizations. Among their primary functions, there are the orientation about work related accidents and labor diseases and their prevention. To raise what are the possible accidents in the workplace is nurse's duty along with a work safety professional who maps potential risk areas (MATOS; SILVA; LIMA, 2017). Therefore it is noticeable the importance of occupational nurses in a hospital environment. They can contribute by developing distinctive actions capable of making workers aware about individual protection equipments (IPE), certain medicines use and the importance of maintaining good health (MATOS; SILVA; LIMA, 2017). Adoption of safe activities and adequate protection equipments use in nursing workplace can reduce occupational accidents. Aside from that it may develop the habit of preventing and promoting professionals' awareness about aseptic techniques and correct procedures. With that, it may guarantee the reduction of occupational risks to professionals. The main limitation of this study was the access to the city data. The database does not provide many variables to analyze, what impedes a deeper inquiry on occupational accidents occurrences to healthcare workers. However, it was possible to promote an analysis about the historical series of accounts which occurred in Passos from 2002 to 2028 with the available data, contributing to improving action plans to increase worker's safety.

Conclusion

The historical series showed a considerable elevation of occupational accidents notifications from 2007 to 2014 and mitigation in the following years, with a posterior increase in 2018. Auxiliaries, medical technicians and nurses were the most affected by accidents. Exogenous intoxication and exposure to biological material were the most notified types of accidents. The injuries that most affected these professionals were cuts, lacerations and contusion wounds, attaining mainly their fingers and eyes. Therefore, the importance of promoting more actions to contribute to health personnel safety in their workplace is noticeable, once this environment may offer many occupational risks to them. For that, healthcare services managers must encourage safe practices at work, training and continuing education beyond accident notifications. In this way, health personnel will have more favorable conditions to execute their job, reflecting positively on the quality of assistance provided to health services users.

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