

Literature review on working environment hazards relative to the working conditions and impact on workers' health

Revisão da literatura sobre os riscos do ambiente de trabalho quanto às condições laborais e o impacto na saúde do trabalhador

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ABSTRACT | Background: Hazards in the working environment might cause damage to the health and integrity of workers as a function of their nature, intensity, length of exposure and concentration, and the susceptibility to them. **Objective:** To analyze national and international literature on risks in the working environment relative to the working conditions and their impact on workers' health. **Method:** Literature review conducted in databases Latin American and Caribbean Health Science Literature (LILACS), *Medical Literature Analysis and Retrieval System Online* (MEDLINE) and *US National Library of Medicine National Institutes of Health* (PubMed), and electronic libraries Scientific Electronic Library Online (SciELO), Virtual Health Library (VHL) and Nursing Database (BDENF). Studies were categorized according to the reported risk factors and/or health problems as "work accidents," "occupational diseases" or "work accidents and occupational diseases." **Results:** Physical hazards mentioned included excessive noise, inadequate temperature, poor air quality, and exposure to sunlight. Chemical hazards involved exposure mainly to pesticides, medications, solvents and disinfectants. Biological hazards exclusively concerned healthcare professionals, especially via contact with patients. **Conclusion:** Health problems among workers are intertwined with several types of hazards. Workers are exposed to material, physical, chemical, biological, cultural and organizational factors as a part of the work process. An integrated approach to the working environment might favor less fragmented actions, and serve as grounds for legislation and public policies respectful of the actual conditions and dignity of workers. **Keywords |** occupational hazards; working conditions; working environment; occupational health.

RESUMO | Introdução: Os riscos no ambiente laboral podem causar danos à saúde e à integridade física do trabalhador devido à sua natureza, suscetibilidade, intensidade, tempo de exposição e concentração. **Objetivo:** Analisar, na literatura nacional e na internacional, os riscos do meio ambiente de trabalho quanto às condições laborais e o impacto na saúde do trabalhador. **Método:** Trata-se de uma revisão da literatura nas bases de dados de Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS), *Medical Literature Analysis and Retrieval System Online* (MEDLINE) e *US National Library of Medicine National Institutes of Health* (PubMed) e nas bibliotecas eletrônicas Scientific Electronic Library Online (SciELO), Biblioteca Virtual em Saúde (BVS) e Banco de Dados em Enfermagem (BDENF). Os estudos foram divididos em riscos e/ou agravos de acordo com o que foi enfatizado no trabalho, como "acidentes de trabalho", "doenças ocupacionais", "acidentes de trabalho e doenças ocupacionais". **Resultados:** Os riscos físicos mencionados foram ruído excessivo, temperatura inadequada, má qualidade do ar e exposição a raios solares. Já os químicos se dão pela exposição — as principais cargas químicas mencionadas são os agrotóxicos, medicamentos, solventes e desinfetantes. Quando aos biológicos, estão relacionados estritamente aos profissionais da saúde, com destaque a contato com pacientes. **Conclusão:** Os agravos à saúde do trabalhador apresentam-se imbricados com diversos tipos de risco. Os trabalhadores ficam sujeitos à exposição a aspectos materiais, físicos, químicos, biológicos, culturais e organizacionais nos processos de trabalho. Uma abordagem integrada do ambiente de trabalho, nesse sentido, propiciaria ações menos fragmentadas, servindo de base para legislações e políticas públicas que respeitem a realidade e a dignidade do trabalhador.

Palavras-chave | riscos ocupacionais; condições de trabalho; ambiente de trabalho; saúde do trabalhador.

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INTRODUCTION

In the present-day world, human life is signaled by increasing uncertainty and a feeling of weakness in regard to hazards and vulnerabilities to which everybody is directly or indirectly exposed. These aspects also influence work, as it represents one of the axis around which human life is structured. Issues related to risk and/or vulnerability are even more significant for healthcare professionals, as they are routinely exposed to a variety of chemical, physical, biological and psychosocial hazards¹.

The working environment is defined as the place where workers perform their job. Within the context of labor relations, the working environment/conditions are in a highly aggressive economic scenario centered on improving productivity by means of continuous technological innovations. The deterioration of the working conditions is evident in the new forms of organization of work, flexibilization of the working hours (longer and/or irregular), precarious employment relationships, increasing under-employment — especially for the outsourced workforce, and job instability — compelling workers to constantly seek new jobs².

Interventions on the working environment and working conditions should be based on judicious and thorough analysis of the organization of work, including the task content, modes of operation, workstations, pace and intensity of work, mechanical factors, physical aspects of workstations, production standards, shift work, psychosocial and individual factors, and relationship with supervisors and coworkers. Further aspects are the collective and personal protective measures implemented by employers, and the collective and personal defensive strategies implemented by workers³.

The working conditions have significant impacts or repercussion on political, economic and social aspects, and also reflect the degree of development of a country⁴.

In regard to prevention targeting workers, article 4, item 2, of the International Labor Organization (ILO) Convention 155 — concerning Occupational Safety and Health and the Working Environment — states that one of the goals to be achieved is “to prevent accidents and injury to health arising out of, or linked with or occurring in the course of work, by minimizing, so far as is reasonably practicable, the causes of hazards inherent in the working environment.”⁵

Juridical grounds to protect the working environment are provided in the Brazilian Federal Constitution, particularly: Title VIII — On Social Order, Chapter II — On Social Security, Section II — On Health, article 200, VII and VIII: “In addition to other actions defined in the law, the unified health system is entitled to: VII—participate in the control and supervision of the production, transport, storage and use of psychoactive, toxic and radioactive substances and products.” Title II — On Fundamental Rights and Guarantees, Chapter I — On Social Rights, article 7, XXII: “The [following] are urban and rural workers’ rights, in addition to others aiming at improving their social status: XXII — reduction of hazards inherent to work by means of health, hygiene and safety standards.”⁶

The historical antecedents of the knowledge on the relationship between work and its effects on health were gathered from graduate dissertations, especially in regard to the period when publishing in journals was rare⁵⁻⁷. Such studies promoted greater engagement of learning institutions and investigators in the performance of research to improve the efficacy of the application of results into practice, likely to achieve outcomes compatible with the dignity of and guaranteed health in the workplace. A prevention-centered culture focused on a healthy quality of life is indispensable for effective protection of the workers’ health^{6,8,9}.

Occupational health is a field of knowledge and practices, which theoretical-methodological approach, in Brazil, emerged from collective health. Its goals are to investigate and interfere with the relationship between work and health/disease, having as core reference the emergence of a new social actor, to wit, the industrial working class, within a social context characterized by profound political, economic and social transformations¹⁰.

The aim of the present study was to analyze the national and international scientific literature on occupational health dealing with hazards related to the working conditions and their impact on the health of workers.

STATE OF THE ART: REGULATORY STANDARDS

According to the 8th National Health Conference (Conferência Nacional de Saúde — CNS) final report¹¹,

from 1986: “dignified working conditions, workers’ knowledge of and control over work processes and environments are a core prerequisite for full access to health.”

The Federal Constitution of 1988 gave rise to a new notion of health, considered in article 196, which states that health is a right of all people and the government’s duty, ensured by social and economic policies to reduce the risk of diseases and other health problems. Article 200, items II and VIII, further state that especially as concerns occupational health, the Unified Health System (Sistema Único de Saúde — SUS) is charged of “Performing health and epidemiological surveillance, and occupational health actions” and “collaborating in the protection of the environment, including the work [environment]”¹².

Legislation on protection of workers includes Administrative Ruling no. 3,214¹³, which comprises a series of regulatory standards (RS) which consolidate the labor laws relative to the Environmental Hazard Prevention Program. Hazards are categorized in RS no. 9, which defines as environmental hazards physical, chemical and biological agents in the workplace, which as a function of their nature, concentration or intensity and length of exposure are able to cause damage to the health of workers¹⁴.

RS 9 item 9.1.1 makes implementation of the Program by employers mandatory, aiming at preserving the health and integrity of workers by anticipating, recognizing, evaluating, and consequently controlling present or future hazards in the workplace, including protection of the environment and natural resources. As a result, five categories of hazards should be included in the Environmental Hazard Prevention Program, to wit: physical, chemical, biological, ergonomic and related to accidents.

Physical agents are the various forms of energy to which workers might be exposed, including: noise, vibration, abnormal pressure, extreme temperatures, ionizing radiation, infrasound and ultrasound. Chemical agents are substances, compounds or products which might penetrate the body through inhalation, in the shape of dust, fumes, fog, mist or vapors, or which as a function of the nature of the activity associated with exposure, might come in contact with or be absorbed into the body through the skin or ingestion. Biological agents are bacteria, fungi, bacilli, parasites, protozoa and viruses, among others¹³⁻¹⁶. Psychosocial hazards

of work are the workers’ perceptions and experiences, some of personal nature, others concerning their expectations of economic reward and personal development, and further others relative to human relations and their emotional aspects¹⁷. Thus, they represent interactions between work and the working environment, job satisfaction and the organizational conditions, on the one hand, and the personal characteristics of each worker, their needs, culture, experiences and perception of the world on the other.

This is the framework within which attempts are made at detecting elements of the working conditions likely to cause damage to the health of workers. The approach to risk factors involved in occupational health must face a high level of complexity, which mandatorily demands going beyond monocausal analyses of risk⁷.

Similarly, Geller¹⁸ emphasizes the high complexity of the risk factors associated with work accidents, as according to him, they never stem from one single cause, but from many, which accumulate until one, i.e., the last, precedes the immediate action which triggers an accident.

METHOD

We chose to perform an integrative review, as it is a method which affords a synthesis of the knowledge available including the applicability of significant studies into practice^{19,20}. A synthesis of the available knowledge is relevant given the increase and complexity of the information on occupational health, and its potential to contribute to the definition of more concise methodological steps, and make better use of the evidence provided by scientific studies^{21,22}.

The first step of the study consisted in the formulation of the research question: What are the risks posed by the working environment, concerning the working conditions and their impact on the health of workers?

The second step involved the definition of inclusion and exclusion criteria for studies, and a literature search in databases Latin American and Caribbean Health Science Literature (Literatura Latino-Americana e do Caribe em Ciências da Saúde — LILACS), *Medical Literature Analysis and Retrieval System Online* (MEDLINE), *US National Library of Medicine National Institutes of*

Health (PubMed) and electronic libraries *Scientific Eletronic Library Online (SciELO)*, Virtual Health Library (Biblioteca Virtual em Saúde — BVS) and Nursing Database (Base de Dados de Enfermagem — BDENF) along the first semester of 2017.

The following controlled terms were used: “*ambiente de trabalho*” (“working environment”), “*saúde do trabalhador*” (“occupational health”), “*condições de trabalho*” (“working conditions”) and “*riscos ocupacionais*” (“occupational risks”). Also operator AND was used. Eligible studies should have been published from 2007 to 2015, in Portuguese, English or Spanish, and have their full text available.

The process evolved as follows: search based on the selected keywords; definition of publication period and languages; and thorough analysis of titles and abstracts, which led to the inclusion of studies which met the review aims and criteria and the exclusion of all others.

The inclusion criteria were: original articles; with full text available open access; included in the selected databases and electronic libraries; having Brazil as country of interest; and published from January 2007 to December 2015. Duplications, review articles, graduate dissertations, essays, reports of experiences, case studies, and articles unrelated to the subject of interest were excluded.

In step three we extracted the data using an ad hoc form, which included categories: name of author(s), title, publication year, database, study design, types of hazards, and place where study was conducted. Step four consisted in thorough analysis of the studies to find answers to the question posed. Step five involved the presentation of results, which was done in tables including detailed analysis of the information gathered, categorized in themes as per type of hazard.

Risk factors were most commonly investigated by means of validated instruments for specific factors, such as anxiety, history of depression, life events, social support and stress, among others.

To facilitate organization and understanding, following the analysis of the main results of each study, we tabulated the data according to five preset domains of analysis, to wit: publication year, author(s), journal, study design, and main results. Both analysis and synthesis of the data extracted from studies were performed in descriptive manner so as to

analyze, quantify, describe and categorize them to reunite the information on the subject of interest.

The sixth and final step consisted in the presentation of the review, in which we clustered the main results of the analysis of the selected studies.

RESULTS AND DISCUSSION

The search and selection in the analyzed databases and electronic libraries allowed retrieving 29 scientific studies which met the review aims (Figure 1).

Many of the main results reported in the studies did not point to health problems as direct consequence of poor working conditions. It should be noticed that in some cases two or three aspects had been addressed at one time²³⁻²⁸.

Among the physical hazards evidenced, excessive noise²⁹ and inadequate temperature^{30,31} stood out. In regard to the quality of the air, lack of ventilation and presence of smoke or pollution were mentioned³¹. Excessive exposure to sunlight — among workers with outdoor jobs — deserves special mention^{28,31,32}.

About 20.69% of the studies mentioned chemical hazards resulting from the handling of a wide variety of substances. The most exposed populations were rural workers³², painters³³ and healthcare professionals. Independently from

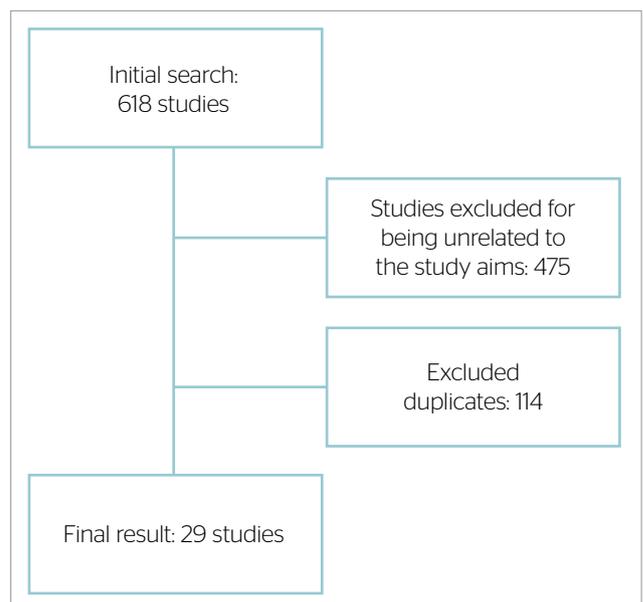


Figure 1. Diagram representing the process of study search and selection, 2007-2015.

the chemical involved, inadequate labeling was a factor with considerable contribution to exposure, as workers are deprived from proper information on risk. The main chemicals mentioned were pesticides, medications, solvents and disinfectants.

Biological hazards were mentioned in 31.03% of the studies³⁴⁻⁴¹, and usually concerned healthcare professionals, as such agents might be transmitted through direct or indirect contact with patients — directly, through the hands or use of non-sterile materials; indirectly, through the air or contaminated objects. It is worth calling the attention to the relationship between biological risk factors and sharps injuries. As a function of the complexity of the risk factors involved in work accidents, the latter never result from a single, but always from several causes, which accumulate until one, i.e., the last, triggers the immediate action resulting in an accident^{42,43}.

Technical and material factors gradually become intertwined with human factors in the analysis of occupational hazards. Indeed, studies which analyzed the influence of working conditions and the organization of work on the occurrence of accidents and illnesses point to a working environment with physical, chemical and biological factors unfavorable to the health of workers⁴⁴⁻⁴⁶. Acknowledging one single action as causal link between the conditions for production and occurrence of health problems masks the actual violence represented by the organization of work imposed to workers.

Chart 1 describes all the articles included in the present review according to the following categories: publication year, author(s), journal, study design and main results.

The largest proportion of studies were published in 2013, 17.24% (n=5) (Figure 2).

About 41.38% of the studies (n=12) were conducted with healthcare professionals, 27.58% (n=8) corresponding to nursing professionals; 24.24% (n=7) with informal workers (fishermen, street vendors); and 24.24% (n=7) with other professional categories, among which two with teachers and physicians, in addition to industrial workers, radiotherapy technicians and flight controllers — n=1 each (Figure 3).

The results show that scientific research still has a fragmented approach, and focuses on the better organized occupational categories: 12 of the 29 studies analyzed health professionals. A wider perspective is needed for the working environment, given the adjustments needed

to truly understand the actual working conditions in the face of the perverse logic of the capitalist system, which prioritizes profit at the expense of the principle of the dignity of the human person and the social value of work^{47,48}.

The results further show that some occupational categories remain invisible and not protected by the law, as is the case of informal workers. Within this context, we emphasize underreporting, which hinders estimations of the actual situation of events and problems affecting the population. In addition, the Brazilian occupational health information systems are restricted to severe cases requiring hospital admission, and as a rule leave out accidents and deaths among informal workers, i.e., not registered with the social security system⁴⁹.

In the analysis of the main results of the included studies we identified two main lines: studies which merely described risk factors, and studies which reported occurrence of events, such as work-related diseases and accidents (Figure 4).

Policies targeting integral workers' health and focusing on the quality of life of workers need support⁴. According to ILO, efforts should be invested in the prevention of work-related accidents and health problems. Term working environment denotes a more general view not restricted to the study of the occupational safety, health and hygiene regulations included in the Consolidation of Labor Laws (Consolidação das Leis do Trabalho — CLT) or some functional statutes⁵.

We stress the relevance of public policies for occupational health to improve the working conditions. Occupational hazards and the vulnerabilities which befall on workers are mainly due to shortage of resources to perform work, physical and moral violence, and emotional exhaustion derived from the socioeconomic and cultural context within which work is included.

FINAL CONSIDERATIONS

Health problems among workers are intertwined with several types of hazards in the working environment. Workers are exposed to material, physical, chemical, biological, cultural and organizational factors as a part of the work process. An integrated approach to the working environment might favor less fragmented public policies.

Chart 1. Characterization of studies included for review according to five domains of analysis, 2007-2015.

Year	Author(s)	Journal	Design	Results
2015	Ceron M, Magnago T, Camponogara S, Luz E, Beltrame M	Revista de Pesquisa: Cuidado é Fundamental	Quantitative	Prevalence of accidents of 17.8%. The largest proportion of accidents involved men (26.3%) and workers aged 19 to 34 years old (21.6%). Sharps injuries and falls predominated
2015	Ferreira AP	Revista Brasileira de Medicina do Trabalho	Qualitative/quantitative	In regard to occupational risk factors, workload and stress impacts on mental health professionals were analyzed. The aspects which stood out were: physical tiredness at the end of the work day, risk of physical violence, and having to deal with individuals with mental disorders
2015	Rios MA, Nery AA, Rios PAA, Casotti CA, Cardoso JP	Cadernos de Saúde Pública	Quantitative	The incidence of work accidents (in the past 12 months) was 32.3%. On multivariate analysis, the odds of accidents were higher for men (OR = 1.61), youths (OR = 4.62), meat/poultry suppliers (OR = 9.55) and workers subjected to high physical effort demands
2014	Carvalho IGS, Larrea-Killinger C, Rêgo RCF, Rocha JCS, Pena PGL, Machado LOR	Ciência & Saúde Coletiva	Qualitative	New claims to improve the working conditions. Environmental/labor legislation in Brazil needs interdisciplinary dialogue to ensure a healthy working environment to artisanal fishermen and seafood gatherers
2014	Júnior E, Oliveira E, Souza N, Lisboa M, Silvino Z	Revista de Enfermagem UERJ	Qualitative	Factors influencing the safety of intensive care workers following inclusion of hard technologies were: knowledge on the critically ill patient and technologies obtained in training courses; on-the-job training; and personnel availability
2014	Júnior E, Oliveira E, Souza N, Lisboa M, Silvino Z	Revista de Enfermagem UERJ	Qualitative	Factors influencing the safety of intensive care workers following inclusion of hard technologies were: knowledge on the critically ill patient and technologies obtained in training courses; on-the-job training; and personnel availability
2014	Régis ACFC, Crispim KGM, Ferreira AP	Revista CEFAC	Qualitative/quantitative	The prevalence of hearing loss was higher among workers above 45 years of age and with more than 21 years in the job. Only 11.1% of workers with more than 21 years in the job had normal hearing, while 61.9% exhibited hearing impairment suggestive of noise-induced hearing loss. The overall incidence of hearing loss was 28%, 19.7% of which suggestive of noise-induced hearing loss. Mild hearing loss predominated
2014	Simões M, Rocha A	Revista Brasileira de Saúde Ocupacional	Quantitative	The most prevalent disorders concerned the musculoskeletal system (23.5) followed by the respiratory system (14.3%), injury, poisoning and certain other consequences of external causes (9.2%) and symptoms, signs and abnormal clinical and laboratory findings (9.0%)
2013	Camargo TRL, Melo SN	São Paulo: LTr	Documentary research	Emphasis on the theoretical and practical applicability of the principles of prevention and precaution in labor justice based on jurisprudence and case studies
2013	Pena P, Martins V, Rego R	Revista Brasileira de Saúde Ocupacional	Qualitative	Ergonomic overload derived from exposure to several hazards; precarious living conditions; invisibility of accidents and work-related diseases, such as repeated strain injury; absence of preventive and healthcare actions; relevance of traditional knowledge on the organization of artisanal fishing

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Chart 1. Continuation.

Year	Author(s)	Journal	Design	Results
2013	Silva E, Valença C, Lima G, Oliveira M, Germano R	Revista de Pesquisa: Cuidado é Fundamental	Qualitative	The main problems found were related to transport, storage places, manual tools, workstation design, lighting, environmental risk, comfort and well-being, and PPE
2013	Valença C, Azevedo L, Oliveira A, Medeiros S, Malveira F, Germano R	Revista de Pesquisa: Cuidado é Fundamental	Qualitative	Most studies on nursing professionals' health address biosafety, exposure to biological hazards, occupational stress and measures for its control and prevention
2012	Correa RA, Souza NVDO	Revista de Pesquisa: Cuidado é Fundamental	Qualitative	Challenges to the use of PPE by nursing professionals; low adherence of nursing professionals to PPE
2012	Araújo TM, Barros LM, Caetano JÁ, Araújo FN, Ferreira Júnior FC, Lima ACF	Revista de Pesquisa: Cuidado é Fundamental	Qualitative	Most professionals reacted similarly to accidents, with feelings and emotions such as despair, fear, anxiety and worry, among others
2011	Gomez C, Machado JMH, Pena PGL	Rio de Janeiro: Fiocruz Publishers	Documentary research	Among the main contributions: inclusion of the service sector in the debate on occupational health; reflections on mental health issues, including workers' subjectivity, suffering and stress
2011	Machado M, Machado F	Revista Brasileira de Saúde Ocupacional	Qualitative/quantitative	Only 64/178 victims reported accidents, resulting in an underreporting rate of 64%. The authors concluded that the results evidenced a need to redesign the referral protocol for accident victim care, and effective participation of nursing professionals in this process
2011	Magalhães NAC, Farias SNP, Donato MD, Domingos AM, Mauro MYC	Revista Enfermagem UERJ	Quantitative	Musculoskeletal and mental diseases were the most frequent causes of sick leaves for all the analyzed occupational categories
2011	Vasconcellos S, Fisher F, Reis A, Moreno C	Revista Brasileira de Epidemiologia	Quantitative	Pain was reported by 69.7% of the sample, involving 77.3% of the women and 60.3% of the men. The body sites where pain was most prevalent were the neck (69.2%) and lower back (69.7%)
2010	Aguiar O, Fonseca M, Valente J	Revista de Nutrição	Quantitative	According to the participants' perception, the frequency of environmental discomfort factors was: temperature (90.1%), noise (51.2%), physical effort (36.2%) and lighting (10.5%). The prevalence of work-related musculoskeletal diseases diagnosed by a physician was 15.0%. Work accidents in the past 12 months involved cuts (20.2%) followed by contusions (16.0%)
2010	Bessa M, Almeida M, Araújo M, Silva M	Revista de Enfermagem da UERJ	Qualitative/quantitative	Ergonomic hazards were the occupational risk factors most frequently perceived by workers, followed by biological, accident-related, physical and chemical hazards

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Chart 1. Continuation.

Year	Author(s)	Journal	Design	Results
2010	Ribeiro H, Ficarelli T	Saúde e Sociedade	Qualitative/quantitative	The interviewees presented a dilemma between clean air and job perspectives. Many could not make a decision, and had no incentive to work in other areas, although a large part liked their place of residence and were interested in continuing in agricultural jobs
2009	Soares RS, Silva JLL, Almeida JHA, Lopes MR, Moreno RF, Souza VR	Revista de Cuidados Fundamentais	Qualitative/quantitative	Identified causes of risk of accidents were: lack of attention, poor working conditions, and inadequate techniques
2009	Palma A, Mattos U, Almeida M, Oliveira G	Revista de Saúde Pública	Qualitative/quantitative	The background noise level was 66.89 dB(A) on average. Significant difference ($p < 0.001$) was found between mean background noise and class phases. Noise was not correlated with minor mental disorders
2009	Peres F	Ciência & Saúde Coletiva	Documentary research	The data described and discussed put an intriguing problem to the Brazilian collective health: what efforts should be made when all possible options are inadequate?
2008	Heloani R	Revista Psicologia Política	Qualitative	The current crisis is an accident in itself. We might even represent it through the following mental image: a polygon including all what is happening, all actions taking place... Each accident does not only look like the crisis, but actually represents the terrible materialization of it
2008	Vedovato T, Monteiro M	Revista da Escola de Enfermagem USP	Quantitative	20.9% of the sample did not sleep well at night; 82.1% had some disease diagnosed by a physician—musculoskeletal and respiratory disorders (27.1%), accidents or gastrointestinal disorders (22.1%), and mental disorders (20.9%). Such conditions were related to the reported risk factors: repetitive movements, chalk dust, stressful work, long working hours, jobs in more than one school, and low salary
2008	Nascimento G, David H	Revista de Enfermagem UERJ	Qualitative	The set of symptoms and health problems makes approaching this population of workers from the perspective of their exposure to the various described hazards compelling to formulate support strategies
2007	Lourenço EAS, Bertani IF	Revista Brasileira de Saúde Ocupacional	Qualitative	Three situations were discussed: rural, informal and child work. Contradiction was found within category work: on the one hand it is synonym with sociability, and on the other it represents a mechanism of social exclusion inasmuch as it is done without acknowledging social and labor rights
2007	Lacaz F	Cadernos de Saúde Pública	Documentary research	The characteristic interdisciplinary approach to research in occupational health is being forsaken, in parallel to the programmatic involution of public health actions within social policies
2007	Ramos E, Silva Filho J, Jardim S	Revista Brasileira de Saúde Ocupacional	Qualitative/quantitative	58.2% of painters reported to never use PPE; 52.73% were not aware of the existence of the Work Accident Prevention Committee; and 92.73% performed some type of repetitive work. Workplace inspection revealed that the working environment and conditions were inadequate

PPE: personal protective equipment.

The results of the present study might serve as evidence to ground the formulation of more efficient preventive legislation and public policies targeting the relationship between work and health, as indicated in article 4, item 2

of ILO Convention no. 155. To remind, upon addressing occupational health and safety and the working environment, this convention demands prevention of accidents and harms.

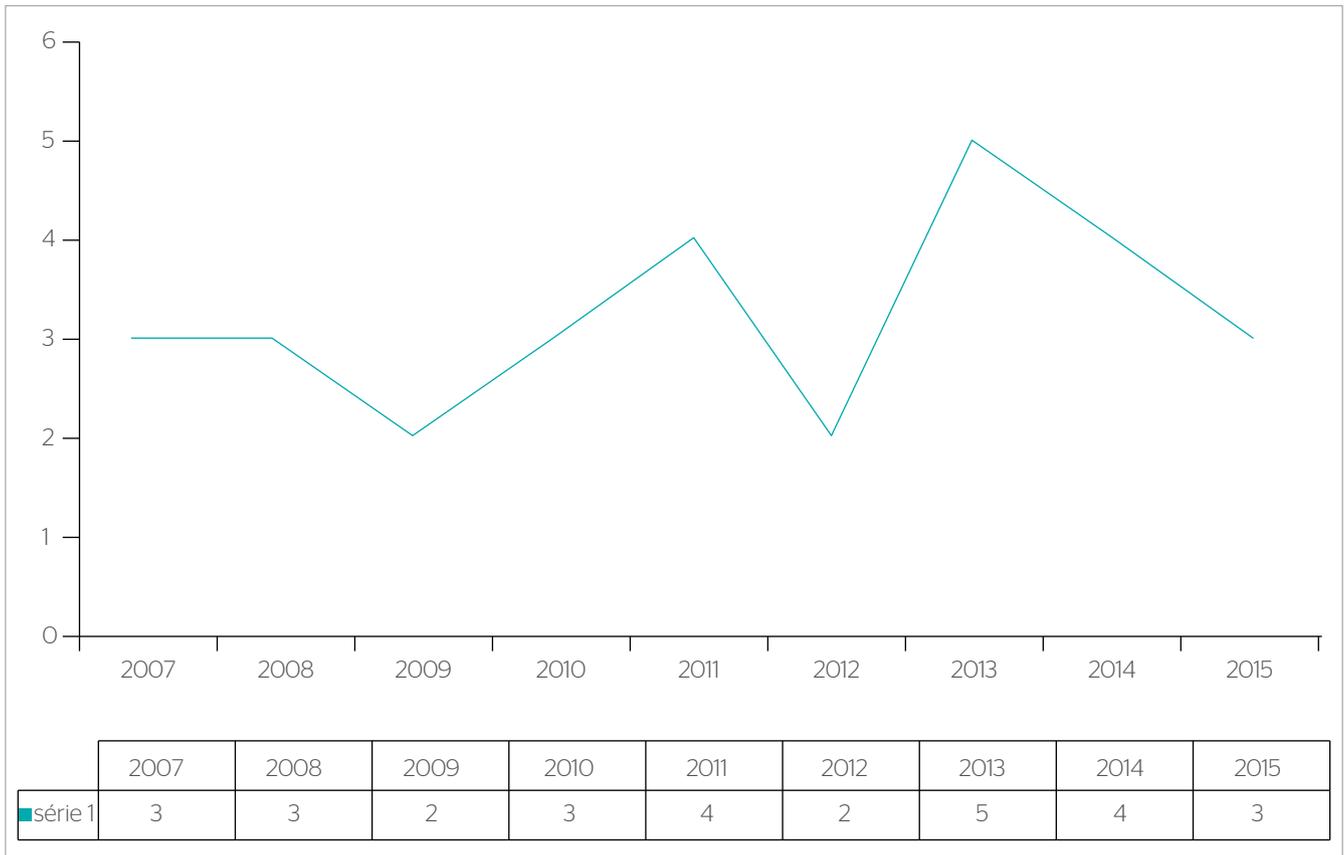


Figure 2. Dispersion of included studies, 2007-2015.

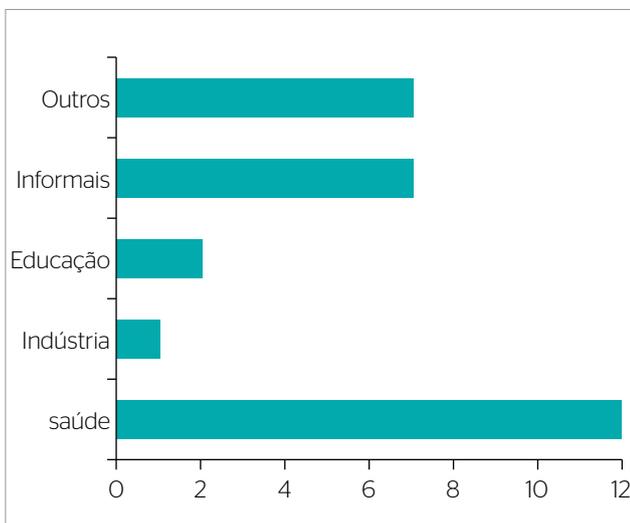


Figure 3. Number of professional categories considered in the included studies, 2007-2015.

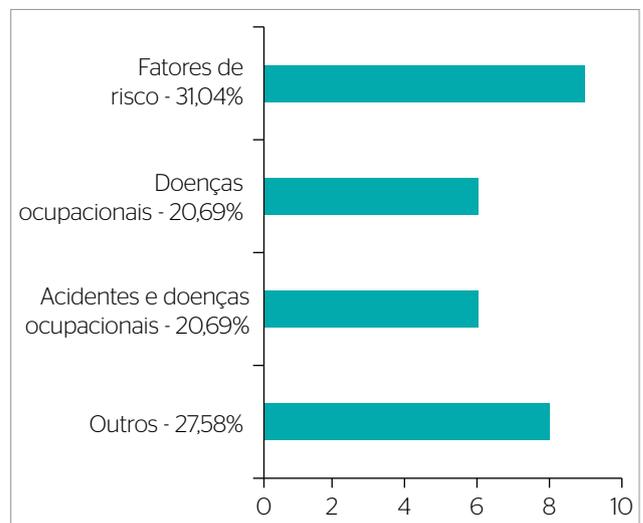


Figure 4. Number of risk factors and health problems identified in the selected studies, 2007-2015.

Given the magnitude of health problems derived from lack of safety and harmony in the working environment, and acknowledging that improvements are difficult to achieve in this case, occupational health should be approached from an integrated perspective, rather than as a mere addition of individual factors. This approach will allow overcoming the model which continues to be reproduced, but which might be complemented with new views to achieve working environments respectful of the dignity of workers.

To make advances in the scientific knowledge on risk factors to which workers are exposed, studies should seek to explore the working environment in a fully encompassing manner. Lack of integration in the approach to the full context of working environments leads to failure in the attempts to arrive at a reliable understanding in the sense that environmental, socio-cultural, biological and psychological phenomena are intimately interrelated.

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