



## LITERATURE SYSTEMATIC REVIEW ARTICLE

## WORK RELATED ACCIDENTS IN THE PRE-HOSPITAL EMERGENCY CARE: A SYSTEMATIC REVIEW

## ACIDENTES DE TRABALHO NO ATENDIMENTO DE EMERGÊNCIA PRÉ-HOSPITALAR: REVISÃO SISTEMÁTICA

## ACCIDENTES DE TRABAJO EN EL SERVICIO DE EMERGÊNCIA PRÉ-HOSPITALARIO: UNA REVISIÓN SISTEMÁTICA

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## ABSTRACT

**Objective:** to analyse the scientific literature on work related accidents and pre-hospital emergency care, published from 2005 through 2010, in the databases of the Latin American and Caribbean Center on Health Sciences (LILACS), International Literature in Health Sciences (MEDLINE), Database of Nursing (BENF) and Scientific Electronic Library Online (SciELO), indexed in the Virtual Library on Health / Regional Medical Library (BVS / BIREME). **Method:** it is a literature research with a quantitative approach. 37 articles were selected in accordance to the follow inclusion criteria: studies published from 2005-2010, in English, Portuguese and Spanish, as full text. Articles that did not attend the purpose of this study were excluded. The form used for collecting data considered the year of publication, study type, approach used, language and main thematic of the articles. Data were analyzed using descriptive statistics and presented in tables. **Results:** 29.73% of the articles were published in 2008, as a descriptive study (62.16%), with a quantitative approach (51.35%), in English (78.38%), mainly accidents involving biological materials (37.84 %) and in the United States of America (43.24%). **Conclusions:** it seems that is priority to continue to carry out research on the theme and make more research on occupational hazards to which professionals of pre-hospital care are more vulnerable. **Descriptors:** accidents at work; pre-hospital emergency care; publications; nursing.

## RESUMO

**Objetivo:** analisar a produção científica, envolvendo os acidentes de trabalho e os atendimentos de emergência pré-hospitalares, publicados no período de 2005 a 2010, nas bases de dados da Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS), Literatura Internacional em Ciências da Saúde (MEDLINE), Base de dados em Enfermagem (BENF) e na Scientific Electronic Library Online (SciELO), indexados na Biblioteca Virtual em Saúde/Biblioteca Regional de Medicina (BVS/BIREME). **Método:** Pesquisa bibliográfica com abordagem quantitativa. Foram selecionados 37 trabalhos, a partir dos critérios de inclusão: estudos entre 2005-2010, em português, inglês e espanhol, em texto completo. Foram excluídos os estudos que não respondessem ao objetivo. O formulário para coleta de dados continha ano de publicação, tipo de estudo, abordagem, idioma e temática central. Os dados foram analisados utilizando-se estatística descritiva e apresentados em tabelas. **Resultados:** 29,73% foram publicados em 2008, com estudo descritivo (62,16%), abordagem quantitativa (51,35%), em inglês (78,38%), destacando-se acidentes com materiais biológicos (37,84%) e nos Estados Unidos da América (43,24%). **Conclusões:** é prioritário dar continuidade à realização de investigações nessa temática e investir em pesquisas sobre riscos ocupacionais a que os profissionais do atendimento pré-hospitalar estão sujeitos. **Descritores:** acidentes de trabalho; atendimento pré-hospitalar de emergência; publicações; enfermagem.

## RESUMEN

**Objetivo:** analizar la literatura científica sobre accidentes de trabajo y la atención pre-hospitalaria de emergencia, publicada desde 2005 hasta 2010 en las bases de datos de la América Latina y el Caribe de Información en Ciencias de la Salud (LILACS), Literatura Internacional en Ciencias de la Salud (MEDLINE), Base de Datos de Enfermería (BENF) y Scientific Electronic Library Online (SciELO), indexada en la Biblioteca Virtual en Salud / Biblioteca Regional de Medicina (BVS / BIREME). **Método:** se trata de una investigación de la literatura con un enfoque cuantitativo. Los 37 artículos fueron seleccionados de acuerdo con los siguientes criterios de inclusión: estudios publicados entre 2005-2010, en Inglés, portugués y español, texto completo. Los artículos que no respondieron a la finalidad de este estudio fueron excluidos. El formulario para la recogida de datos tuvo el año de publicación, tipo de estudio, el enfoque, el lenguaje y la temática principal de los artículos. Los datos fueron analizados utilizando estadística descriptiva y se presentan en tablas. **Resultados:** 29,73% de los artículos fueron publicados en 2008, con estudio descriptivo (62,16%), enfoque cuantitativo (51,35%), en Inglés (78,38%), abordan especialmente los accidentes con material biológico (37,84 %) en los Estados Unidos de América (43,24%). **Conclusiones:** parece que es la prioridad seguir para llevar a cabo la investigación sobre el tema y hacer más investigaciones sobre los riesgos profesionales a que los trabajadores de la atención pre-hospitalaria están sujetos. **Descriptores:** accidentes de trabajo; atención pre-hospitalaria de emergencia; publicaciones; enfermería.

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## INTRODUCTION

Nowadays, in Brazil, the Urgency field is an important component of the health care. Resulting in an increased demand for health care people in this field and contributing to work overload. The urgency care is working as “entrance door” to the health system, accepting patients in real need of immediate health care attention, those with conditions perceived as urgent, the social urgencies, as well as those lacking primary and specialized health care.<sup>1-4</sup>

The patient’s immediate needs, acute or urgent, are stress points that demand fast actions. The health system should be able to accept this type of patients, giving assistance and referring them to the appropriate treatment service.<sup>2,5-6</sup>

Based on the necessity discussed before, the Pre-hospital Health Care (APH) was established in Brazil, meaning those emergencies care rendered to patients at the scene of an accident and transportation of such patients to the specialized hospitals. This type of assistance should have quality to mitigate possible consequences and ensure the patient’s life until the hospital.<sup>2,6</sup>

This preoccupation with the association between first aids to support life and transportation until a hospital, was originated in France in the French Revolution in the 17th century, initiated by the medical student Dominique Larrey.<sup>7-8</sup>

From this time forward, the health care services in emergency and the transportation means used have undergone important techno-scientific modifications, as the use of sophisticated technological devices, and training the multidisciplinary teams.

Thus, due a gradual increase in mortality rates as a result of violence, traffic accidents, cardiovascular diseases, respiratory diseases, metabolic disorders. It also increases the necessity to ameliorate the organization of health system delivery to users, in order to reduce the current overload in the urgency and emergency services available. In accordance with that, this field has been considered one of the most problematic to the Unified Health System (SUS) and to the society.<sup>9-10</sup>

Within this context, some authors<sup>11-13</sup> contribute to this thematic issue, when they report that professionals working at APH transportation deserve an special attention, since that this type of service could expose their workers to several hazards while on duty, mainly related to dealing in a direct or

indirect way with major bleeding, trauma, organic materials excreted and secreted by patients with potential risk for diseases. For this reason is required, in general, invasive procedure, plus quick action, leading sometimes the professional to ignore the biosafety rules. According to theses authors, these clients, in turn, can act as a source of transmission of microorganisms to professionals and other victims.

These working conditions potentiate exposure to biological material, mainly in cases of percutaneous injuries, since the procedures are performed in a small space, inside a vehicle in movement, sometimes. It is highlighted that the biological risk is considered one of the main reasons for creating hazardous and unhealthy conditions for health professionals.<sup>11,14-15</sup>

Some studies<sup>7</sup> discuss others occupational risks that professionals working at APH are exposed, not only biological, but physical, chemical and ergonomic.

In a research on occupational risks at the Mobile Emergency Attendance Service (SAMU) from Florianópolis (SC), the author founds out that the raining, humidity, noise, electricity, luminosity and warmth were the physical hazards encountered by professionals of SAMU. The researcher reports others categories of occupational hazards, such as mechanical risks related to transportation/removal of victims, accidents involving the ambulance due high speed and the stress caused by the care of seriously injured patients still at the scene<sup>7</sup>.

According to it, is necessary to identify the situation of the researches on accidents related to work involving the pre-hospital emergency service delivery, since that it is believed on searching of evidence that aims to contribute to the improvement of quality in assistance to these workers. Also, it becomes important to identify the current stage of research on accidents at work related to the delivery of pre-hospital emergency health care, since it is believed that seeking evidence that address to contribute to improving quality of the assistance to workers, besides facilitating the development of coping strategies for diseases prevention, focusing on reducing work related accidents and occupational hazards and their consequences.

Being aware of the harmful consequences of the work related accidents, a research question was formulated: what trends are ongoing in scientific production involving accidents at workplace and pre-hospital emergency care delivery? In order to answer

the research question, the following objectives had been set:

To analyse the scientific production, involving accidents at workplace and pre-hospital emergency care delivery, published from 2005 through 2010 in the electronic databases of Latin American and Caribbean Health Sciences (LILACS), International Database for Medical Literature (MEDLINE), Nursing Database (BDENF), and the Scientific Electronic Library Online (SciELO), indexed in the Virtual Health Library/Regional Library of Medicine (BVS/BIREME).

METHOD

It is a bibliographic research, categorized as an integrative review on accidents at workplace and pre-hospital emergency care delivery. Bibliographical studies reveal the ideology, technical guidance, scientific, political and the primarily concerns underlying the issue researchead.<sup>16</sup>

As a technique, the literature review includes reading, selection of studies, filing and archiving topics of interest related to research object, in order to know the scientific contributions made by researchers on several fields of study.<sup>17</sup>

Therefore, a bibliographic retrospective was performed from the last six years (2005-2010) through the electronics database LILACS, MEDLINE, SCIELO and BDENF in BVS/BIREME, using keywords “accidents at work” and “pre-hospital emergency care” according to Health Sciences Descriptors (DECS).

The data were collected from July to August 2010.

The inclusion criteria during this study review were as follows: studies on the subject published from 2005 to 2010, in English,

Portuguese and Spanish languages, available as a full text or abstract. The exclusion criteria have focused on studies that were not relevant to answer the research question. The cohort study period is justified for ensuring the data timeliness, focusing on trends in the research analyzed.

In this sense, it was found a total of four articles in LILACS and thirty-three in MEDLINE databases, then, the studies were selected after refinement. No studies were found in BDENF and SCIELO database after have adopted the inclusion criteria. It was used as data colleciton, a form with information on publication year, type of research methodology used (descriptive, theoretical review, action research, exploratory, experimental, case studies and experience reports), the method (quantitative, qualitative, quanti-qualitative), language and thematic studied.

This instrument was submitted to the evaluation of three nurse researchers regarding clarity, objectivity and content appropriate to the issue studied.

The data were analyzed through a descriptive statistics, using a quantitative approach and presented through tables.

RESULTS AND DISCUSSION

The table 01 shows the publications characteristics involving accidents at workplace and pre-hospital emergency care delivery, according to the publication year, type of design used, method and kind of publication.

**Table 01.** Studies characteristics on accidents at workplace and pre-hospital emergency care, published in BVS/BIREME from 2005 to 2010, regarding publication year, study design, method and kind of publication. Natal/RN - 2010.

Variables	Lilacs		Medline		Total	
Year	n	%	n	%	n	%
2005	1	2.70	5	13.51	6	16.22
2006	0	0.00	8	21.62	8	21.62
2007	1	2.70	7	18.92	8	21.62
2008	1	2.70	10	27.03	11	29.73
2009	1	2.70	2	5.41	3	8.11
2010	0	0.00	1	2.70	1	2.70
Study design						
Descriptive	4	10.81	19	51.35	23	62.16
Review	0	0.00	10	27.03	10	27.03
Case study	0	0.00	4	10.81	4	10.81
Method						
Qualitative	0	0.00	8	21.62	8	21.62
Quantitative	3	8.11	16	43.24	19	51.35
Quali-quantitative	1	2.70	9	24.32	10	27.03
Kind of publication						
Abstract	2	5.41	23	62.16	25	67.57
Full text	2	5.41	10	27.03	12	32.43
Total	4	10.81	33	89.19	37	100.00

The table 01 shows that the majority of studies (29%) were published in 2008, then 2006 and 2007 with 21.62% each. The year of 2010 had the lowest publications, with only 2.7%. It could be justified by the months of data collection, which included articles until July and August 2010.

Regarding to the study design, descriptive (62.16%) was the most used, followed by literature review (27.03%). The descriptive researches are widely used to investigate biological accidents, since this kind of research sought to describe phenomena in natural settings through a descriptive way, examining in depth the practices and attitudes of individuals or groups living in the real world.<sup>18</sup>

Concerning the research method more used, the quantitative was adopted in 51.35% of the publication, followed by the quanti-qualitative with 27.03%. The reason for that could be explained because the studies had approached accidents at work in the emergency services, those kinds of accidents are registered in notification application forms, which is quantitatively analyzed by services and also by other responsible sectors.

Despite that, the quantitative paradigm, hegemonic in the biomedical research, uses methods from the physical sciences, epidemiology and statistics. It is characterized by adopting the deductive methods and seeking objectivity, validity and reliability.<sup>19</sup>

The quantitative research is characterized by the performance levels of reality and by adopt the objectives of identification and presentation of data, indicators and trends

observed. Such research shows, in general, is appropriate when there is possibility to collect quantifiable measures of variables and inferences from population samples.<sup>20</sup>

This type of method use numerical measures to the hypothesis test, through a rigorous data collection, or it seeks numerical patterns related to concepts from the daily basis. In a later stage, the data were examined using a statistical analysis, through a mathematic model (or appropriate software), aiming to test the hypothesis formulated.<sup>20</sup>

One of the main charcteristics of a quantitative research method is becoming weak or weakened in terms of internal validity (how will they measure what they wanted to measure?), although they are strong in terms of external validity, since the results are generalizable to the wider community. It can be stated that a relationship cause-effect is established, than it makes a prediction on phenomena. Carrying out a rigorous and meticulous nature, this method involves deepening the literature review and detailed preparation of a research plan well formulated in terms of goals and properly structured.<sup>20</sup>

The most common kind of publication was abstract (67.57%), followed by full texts with 32.43%. This finds are not considered very significant, since the scientific community has no access to the full article.

In this second moment, the data will be presented through Table 02 with data in accordance to language, thematic and country where the study was developed.



**Table 02.** Studies characteristics on accidents at workplace and pre-hospital emergency care, published in BV5/BIREME from 2005 to 2010, regarding language, thematic and country studies. Natal/RN - 2010.

VARIABLES	LILACS		MEDLINE		TOTAL	
Language	n	%	n	%	n	%
Portuguese	3	8.11	1	2.70	4	10.81
English	1	2.70	28	75.68	29	78.38
Spanish	0	0.00	4	10.81	4	10.81
Total	4	10.81	33	89.19	37	100.00
Thematic						
Accidents involving biological	2	5.41	12	32.43	14	37.84
Adherence to standard precaution	1	2.70	4	10.81	5	13.51
Accidents involving ambulance	1	2.70	7	18.92	8	21.62
Disaster management training	0	0.00	5	13.51	5	13.51
Occupational exposure	0	0.00	3	8.11	3	8.11
Traumatic amputation	0	0.00	2	5.41	2	5.41
Total	4	10.81	33	89.19	37	100.00
Country studies						
Brazil	4	10.81	2	5.41	6	16.22
United States	0	0.00	16	43.24	16	43.24
France	0	0.00	1	2.70	1	2.70
Japan	0	0.00	2	5.41	2	5.41
Italy	0	0.00	4	10.81	4	10.81
Germany	0	0.00	4	10.81	4	10.81
England	0	0.00	2	5.41	2	5.41
Polonia	0	0.00	1	2.70	1	2.70
Spain	0	0.00	1	2.70	1	2.70
Total	4	10.81	33	89.19	37	100.00

Regarding the language, 78.38% of the studies were available in English. Although widely considered to be the universal language, after all, most of the world's population do not speak or read in English, since a significant percentage of the world's inhabitant lives in developing countries and they have no access to another language other than the one spoken in their country. In practice, this fact restrict the access to information.

The theme found in the articles on accidents involving biological material (37.84%) highlighted it as the main factor affecting professionals who work at the emergency pre-hospital care. Second, the studies give attention to accidents involving emergency vehicles (21.62%), as collisions and rollovers.

Authors<sup>21</sup> claim that the nursing teams, mainly those working at hospitals, spend 24 hours in contact with patients, mostly performing “care” framed with the perspective of “doing”, leading to the exposure to a myriad of risks, in addition they may acquire occupational diseases, also work related injuries.

The contact with pathological microorganisms from accidents caused by sharp and needlestick injuries commonly occur in the execution of nursing care. The exposure to biological material means the possibility of contact with blood and body fluids in the workplace, and ways of getting exposure include percutaneous injection

through needles or sharp objects, and direct contact with skin or mucous.<sup>22</sup>

The highest risk for workers of the health field is the accidents caused by sharp and needlestick injuries, because it exposes workers to pathogenic microorganisms, the hepatitis B has the highest incidence among these workers.<sup>22</sup>

With the rise of Acquired Immunodeficiency Syndrome (AIDS), known worldwide as AIDS, greater emphasis has been given to the worker's exposure to the blood. The occupational prevention against the Human Immunodeficiency Virus (HIV) has become a major challenge to professionals from the Hospital Infection Control and Occupational Health, after a nurse has become infected with AIDS as a result of accidental prick with a needle containing blood from a patient infected with HIV at a hospital in England. The *Centers for Disease Control* (CDC), worried about the transmission of HIV and other blood borne pathogens, organized a system for collecting information (EPINet), from that it proposes strategies to mitigate the problem on workers exposed to occupational risk of contamination.<sup>21</sup>

According to data from CDC, the annual estimate of needlestick injuries in health workers at hospitals is 384,325 cases, and the risk of contamination with the HIV virus (AIDS) is 0.3%, the HBV virus (Hepatitis B) is 6% to 30%, and risk of contamination is 0.5% to 2% for HCV (Hepatitis C).<sup>21</sup>

Regarding to the country studies, the United States published more studies, 43.2%, followed by Brazil (16.22%) from the selected publications sample.

This result, even if they're already expected, reaffirms the sovereignty of the United States of America as the most developed, to be in the top ranking of scientific output in the world.

## CONCLUSION

The findings of this study allowed us to conclude that the scientific production involving accidents at workplace and pre-hospital emergency care from 2005 to 2010 in MEDLINE and LILACS database are characterized by being published, mostly in 2008 (29.73%) adopting a descriptive study design (62.16%), and the quantitative approach as method (51.35%), available as abstract (67.57%), in English (78.38%) highlighting the thematic of accidents involving biological materials (37.84%), and the United States of America (43.24%) as the country with most published in the last six years.

The discussion on the impact of such accidents requires a rethinking on social commitment of research and production. This kind of production is historically situated and socially determined to indicate protocols or solve problems that affect a specific social group. With these results, it is intend to contribute to development of coping strategies for prevent injuries, focusing on reducing the incidence of accidents at workplace and their serious consequences.

It is also believed that such approach could identify the indicators useful to provide a reflection on the occupational hazards reality faced by workers in the service of SAMU, fostering the nurse role in the continuing education, holding discussions on the adoption of care standards by the work team, proposing strategies for adopting these measures, thereby improving worker safety and consequently the assistance provided.

It is concluded, therefore, that the priority is continue to carry out research on these themes and at the same time invest in the development of research using a descriptive approach of the occupational hazards faced by professionals from the pre-hospital care, and contributing to provide a better preparation to health professionals working at emergency care.

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