

# Profile of Brazilian dissertations and theses on trauma: a documentary research

## *Perfil das dissertações e teses brasileiras acerca do trauma: uma pesquisa documental*

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### A B S T R A C T

**Objective:** To characterize the dissertations and theses available in the Bank of Theses of the Coordination for the Improvement of Higher Education Personnel (CAPES) that deal with trauma. **Methods:** This is a documentary research on the characterization of Brazilian theses and dissertations that deal with trauma, available at the CAPES Theses Database. Data collection was carried out in March 2012, by master's degree students and PhDs, following a research protocol. **Results:** A total of 411 dissertations and theses about trauma were analyzed. We elucidated considerations on the following aspects of the selected studies: academic level, location of conduction of the work, author's training, methodological design, theme and type of trauma. **Conclusion:** The significant amount of studies analyzed reveals the importance of trauma in the current scenario, the expansion of graduate programs and researchers being in line with the theme that alarmingly affects the national and international epidemiology.

**Key words:** Scientific research and technological development. Dissertations, academic as topic. Wounds and injuries. Emergency medicine. Emergency medical services.

### INTRODUCTION

The word trauma comes from the Greek, meaning sore. Currently, it is a terminology used by medical and other health related areas, presenting concepts that relate to events and producers of unwanted injury or damage and a set of disturbances arising from physical agents with diverse etiology and nature<sup>1,2</sup>.

Thus, trauma is seen as a major public health problem in all developed and developing countries, ranking third worldwide cause of death, preceded only by cardiovascular diseases and cancer<sup>1,2</sup>.

Trauma differs from other public health problems by leading to physiological and structural changes through exchange of mechanical, chemical, thermal, electrical and irradiation energies between the body, specifically the tissues, and the external environment<sup>2-4</sup>.

The International Classification of Diseases (ICD-10) defines the group of trauma – accidents, intentional injuries, other external causes of accidental injuries and assaults – as External Causes<sup>5</sup>.

In Brazil, the epidemiological scenario of trauma has significant representation in the mortality statistics,

showing an increase in the number of deaths since the 70s. In 2004, injuries were responsible for 127,470 deaths, with particular concentration in urban areas. In 2009, it moved into third place in mortality, causing 138,697 deaths in the age group 15-59 years<sup>1</sup>.

Other statistics show that annually 60 million people suffer from some type of trauma. In 2010, 23,960 Brazilians died as a result of traumatic injuries during the period of stay in health institutions of the Unified Health System (SUS), the main types of trauma being homicides, followed by traffic accidents<sup>2,3,6</sup>.

Trauma may therefore be considered a complex public health problem in Brazil for the following reasons: 1) it constitutes the third cause of mortality; 2) it is responsible for more than 125 000 deaths annually; 3) 400,000 victims will suffer from permanent sequelae; 4) trauma consumes more years of life than the first and the second most health problems related to mortality rates in the country – cardiovascular diseases and neoplasms; 5) it generates high direct and indirect costs with assistance, amounting to a value above the country's foreign debt; and 6) it constitutes a health problem in view of the social, economic and political conjectures, such as

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unemployment, marginalization and automotive industry development<sup>4,7,8</sup>.

Based on the epidemiological importance that trauma has in the Brazilian and international scenario, as well as on the unique role of research as a tool for guiding a health practice that is qualified and consistent with the precepts stated by the Constitution of the Federative Republic of Brazil<sup>9</sup> and the National Policy for Emergency Care<sup>10</sup>, the object of the present study is trauma, and the question it proposes to answer are: 1) What are the characteristics of dissertations and theses available on the Theses Database of the Coordination of Improvement of Higher Education Personnel (CAPES) that deal with the trauma?; 2) What issues related to trauma are being addressed?

To answer these questions, the study aims to characterize the dissertations and theses on trauma available in the CAPES' Theses Database.

## METHODS

This is a documentary research on the characterization of Brazilian theses and dissertations that deal with trauma. The documentary research corresponds to a mode of analysis that uses ample supply of documents considered primary or raw materials, or documents that have not gone through an analytical treatment<sup>11</sup>.

In this perspective, the documentary research of this study was developed in the CAPES Journals Portal, specifically in the CAPES Theses Database. The choice for these types of scientific papers was due to them being characterized by originality, high-level research and the possibility of progress in science, and the dissertations because the methodological rigor is similar to the former's<sup>11,12</sup>.

The documentary research was carried out by Master's Degree Graduates and PhDs. To guide it a research protocol was built, and validated by two of the authors with doctoral degrees. Data collection was performed in pairs.

The protocol, entitled "Protocol Document Search", was composed of the following elements: theme; purpose of the study; guiding questions; search strategies (database, uncontrolled keywords and controlled keywords); study selection (inclusion and exclusion criteria); strategy for data collection; and the table with the results of documentary research.

We used the Portuguese equivalents of the keywords "medical emergency services" and "emergency medicine", controlled by the Health Sciences Descriptors Headings (Descritores em Ciências da Saúde – DeCS), and the uncontrolled keyword "trauma."

Inclusion criteria were selected dissertations and theses available electronically at the CAPES theses database, which dealt with trauma, appraising

epidemiology, prehospital care, hospital care, rehabilitation, prevention, education, ethics and clinical research.

For a better presentation and understanding of the findings, we attributed grades to the aforementioned thematic elements: a) In the theme of "epidemiological aspects", we included studies related to epidemiology and characterization of subjects, events or institutions; b) For "pre-hospital care", studies on the process of prehospital work; c) in "hospital care", those who embraced the work process in the hospital; d) In the theme of "rehabilitation", studies on the rehabilitation activities of trauma victims; e) studies focused on the practices of prevention of traumatic injuries were included in the item "prevention"; f) in "teaching", we grouped the studies about development of educational tools related to traumatic injuries; g) "Ethics" comprised the studies on the ethical aspects of support for victims of trauma; h) In the theme "clinical research", we included experimental studies about traumatic injuries involving human subjects.

Exclusion criteria were the dissertations and theses that: did not consistently address the issue; involved animal research or psychological trauma. It is noteworthy that the temporal dimension has not been established as an exclusion criterion, selecting all dissertations and theses that fit the above inclusion criteria.

The analysis of the methodological design of the studies followed the classification that divides the research in: bibliographic, descriptive, experimental and exploratory<sup>13</sup>.

We evaluated the quality of the evidence, classified into seven levels: level 1 are recommendations arising from systematic review or meta-analysis of randomized controlled trials or derived from clinical guidelines based on systematic reviews of randomized controlled trials; level 2, evidence derived at least from one randomized, well-designed controlled trial; level 3, those obtained from well-designed trials without randomization; level 4, from cohort and well-delineated case-control studies; level 5, evidence originating from systematic review of descriptive and qualitative studies; level 6, those derived from a single descriptive or qualitative study; and level 7, the recommendations arising from the opinion of authorities and / or report of expert committees<sup>14</sup>.

## RESULTS

The research, based on the established protocol, obtained a universe of 1,537 dissertations and theses from the applied descriptors and then subjected to peer review, which resulted in a final sample of 411 scientific works, 27.1 % of the early sample (Table 1).

Regarding the academic level of the selected studies, 306 (74.5%) were from academic master' degree, 83 (20.2%) from doctoral degree and 22 (5.3%) from professional master's degree.

The three higher education institutions with greater production of studies on this subject were the University of São Paulo – USP, with 86 studies (20.9%), the Federal University of São Paulo – UNIFESP, with 38 (9.2%), and the Federal University Minas Gerais – UFMG, with 25 studies (6.0%) (Figure 1).

The selected studies were produced by Medical, Psychology, Dentistry, Nutrition, Speech Pathology, Physiotherapy, Pharmacy, Electrical Engineering, Nursing, Biology and Archaeology. Of these, Medicine stood out with the largest number of productions on trauma, with 200 studies (48.6%), followed by nursing, with 107 (20.0%), and Dentistry, with 66 (16.0 %) (Figure 2).

In assessing the productions of the three major professions in the area of trauma, we have the following table: Medicine produced 165 (82.5%) descriptive researches, 31 (15.5%) experimental studies and four (2.0%) bibliographic researches; Nursing developed 106 (99.1%) descriptive and only one (0.9%) experimental research, and Dentistry held 63 (95.5%) descriptive and three (4.5%) bibliographical works.

Studies dealt mainly with the epidemiological aspects, the subject of 176 of them (42.8%), hospital care, 102 (24.8%), and results of clinical research, 46 (11.1%) (Figure 3).

The types of trauma most referred to in the studies were traumatic brain injury (TBI), with 65 productions (15.8%), orthopedic trauma, discussed in 55 studies (13.4%), spinal cord injury (SCI), the subject of 39 studies (9.5%), traffic accidents and dental trauma, both reported in 37 studies (9.0% each). The data relating to year of production of dissertations or theses about the five types of trauma most often referred to can be seen in figure 4.

## DISCUSSION

The significant number of productions, which comprised the theses and dissertations from 1987 (filed in the thesis database from 1986 to 2010) – ie since the year on which CAPES began archiving scientific work of post-graduate courses – is not only a reflection of the

epidemiological importance that trauma takes the currently, but also a result of the unquestionable expansion of the system of research and graduate programs in Brazil, both in quantity and quality<sup>15</sup>.

The development of research, focusing on sustaining economic growth and improving quality of life, is directly related to daily life, oriented towards the most urgent demands and the search for answers to universal questions. Such is the case of trauma, which assumes, in contemporary times, the character of a serious social and community problem<sup>8,15,16</sup>.

Therefore, the research, which, since the 70s, demands (and develops in) post-graduation courses, reflects the concern of professionals to respond to actual and potential problems with the ultimate goal to focus on improvements, be they of intellectual or practical order<sup>17</sup>. To analyze the process of intellectual production of the researchers also assumes that goal, allowing the knowledge of the profile of research fostered over the years.

As for the academic level of the investigations examined, the picture is consistent with the reality of Brazilian post-graduation courses, in which the academic master's degree, following a historical trend, is the type of postgraduate course that most entitles and grows in the country, the professional master's degree being still incipient, graduating no more than three thousand people a year<sup>18</sup>.

The local development of research also reflects a national stage of productions that predominate in the Southeast and South. By analyzing the data presented in Figure 1, there are the following numbers: 270 (65.7%) studies came from Southeast Brazil, with emphasis on the state of São Paulo, the area with the highest concentration of post-graduation courses in Brazil, 66 (16.1%) studies were produced in the South, 51 (12.4%) in the Northeast, 22 (5.4%) in the Midwest and only two (0.4%) in the North.

One sees thus a predominance of research that follows the same order of Brazilian federative regions as regards the distribution of graduate programs in the country, according to CAPES information for the year 2010<sup>19</sup>. A study evaluating scientific papers presented at the Brazilian

**Table 1** - Results of the documentary research.

| Keyword*                   | Result – Nº (%) | Selected studies according to inclusion criteria <sup>†</sup> – Nº (%) |
|----------------------------|-----------------|--|
| Trauma                     | 1513 (98.4)     | 397 (96.6)   |
| Medical emergency services | 22 (1.4)        | 13 (3.2)   |
| Emergency medicine         | 2 (0.2)         | 1 (0.2)  |
| Total                      | 1537 (100.0)    | 411 (100.0)  |

\* Research done in the search field "subject", through the option "exact phrase".

<sup>†</sup> Dissertations and theses available electronically on the CAPES Theses Database, which deal with trauma; studies that address, on trauma: epidemiology; assistance to trauma victims in the prehospital or hospital environment, , rehabilitation or prevention , education, research and ethics.



Figure 1 - Location of development of selected studies, 2012. Data in absolute numbers.

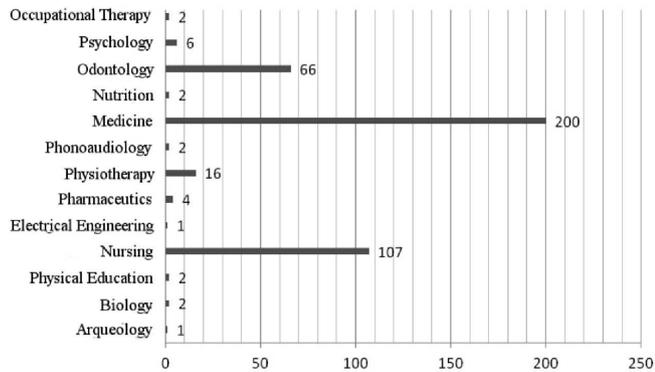


Figure 2 - Formation of the authors of the selected studies, 2012. Data in absolute numbers

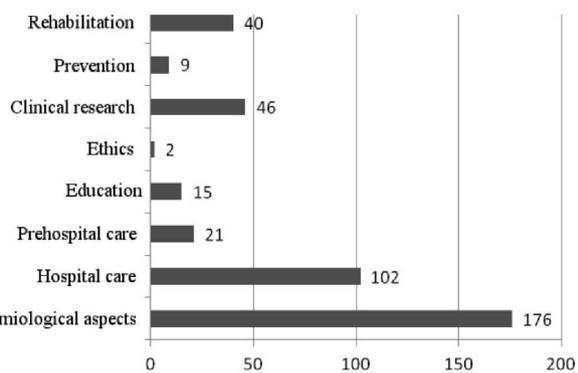


Figure 3 - Themes of the selected studies, 2012. Data in absolute numbers. The more types of trauma reported in the studies were: head trauma

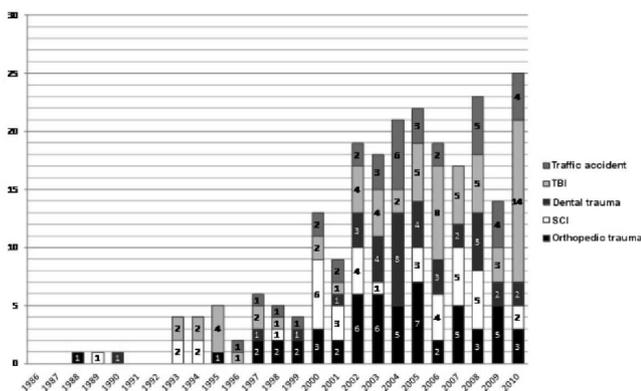


Figure 4 - Publication year of production for the five most common types of trauma in documentary research, 2012. Data in absolute numbers. TBI: Traumatic brain injury; SCI: Spinal cord injury.

Trauma Congress also noted the high proportion of works from the South and Southeast regions, in which São Paulo alone accounted for 28.5% of studies<sup>20</sup>.

By analyzing the formation of the authors, one should note the courses of Medicine, with 200 (48.7%) scientific productions, Nursing, which produced 107 (26.0%) studies and Dentistry, with 66 (16.1%).

It is noteworthy the national role of the postgraduate courses in the great area of "Health Sciences", which comprise 16.0% of all courses in the country<sup>19</sup>. When it is clarified that post-graduation from public educational institutions is currently responsible for 90% of Science production in Brazil<sup>16</sup>, the importance of these courses in producing innovations and, consequently, the promotion of improvement of health care / health care for the Brazilians becomes evident.

It is known scientific work that stimulates development and knowledge progress, focusing on improvements in the ways of approach and intervention for victims of trauma<sup>20</sup>.

However, when analyzing the methodological design of studies, an issue arises: the dominance of descriptive researches and the paucity of experimental studies.

When evaluating the productions of the three major professions in the area of trauma (Table 2), there was a predominance of descriptive studies, totaling 334 (89.5%), with a minimal portion of experimental studies, 32 (8.6%). With regard to the sample analyzed, 364 researches were descriptive (88.6%), 38 were experimental (9.3%) and the remaining nine were literature reviews (2.1%).

To assess the methodological design of studies means to bring up a discussion that is increasingly present in all scenarios, intellectual and care: a research classification based on levels of evidence, which became important more than 20 years ago, when Suzanne Fletcher and Dave Sackett, working on regular examinations for the Canadian Task Force, developed it to rank the validity of preventive health<sup>21</sup>. This classification is based on a study hierarchy that seeks to facilitate understanding of the degree of recommendation from the results of clinical researches<sup>21,22</sup>.

In this study, regarding the quality of evidence, we observed that numerous studies fall within the level of evidence 6. We do not assert, however, that the researches carried out have no significance for intellectual national and international scenario, considering that descriptive studies are also important for the analysis of contexts and to subsidize the production of evidence of higher level. What needs to be stressed, in fact, is the need to balance these figures, encouraging the development of quality experimental research.

The same is confirmed when investigating the data presented in figure 3, in which the themes of selected theses and dissertations are shown. It confirms the predominance of studies on the epidemiological aspects, of unquestionable importance, with highlight to the paucity of clinical research.

A study that sought to evaluate the stage of post-graduation studies in Brazil revealed that the number of Brazilian patents registered per year, less than 4000, is extremely low when compared to countries like China

(122,000), South Korea (128,000) France (14,000), Germany (48,000), Italy (9000), Japan (333,000), Russia (27,000), England (17,000) and United States (240,000), reflecting the existence of low innovation in the corporate sector and nascent national research program linking graduate with production sectors<sup>18</sup>.

Therefore, once again stands out the need to stimulate the development of clinical research, which, according to the literature, allows the expansion of modern treatments or procedures, cutting-edge health care, international investment, technological development of the sector and improvement of health care institutions as a whole<sup>23</sup>.

It should be noted, moreover, the low increase of research on prevention of trauma, which, according to academics, is the most important parameter to control trauma: "a) it is the only way to prevent fatalities occurring at the site of accident; b) it is the most efficient and inexpensive to reduce costs (deaths, suffering, costs, loss of productivity, etc.), of trauma disease; c) and, in most cases, it is possible"<sup>8</sup>.

The types of injuries covered in the study were: facial, orthopedic, vascular, spinal, dental, abdominal, cranial, chest, pelvic, rectal, burns, violence and traffic accidents, and studies that did not specify a type of trauma, elucidating the generic aspects of the educational process, the process of health professionals working in prehospital settings and hospitals, or even dealt with accidents in a general way (such as household accidents and external causes) or polytrauma.

There was a predominance of studies on TBI, orthopedic trauma, SCI, traffic accidents and dental injuries, as seen in Figure 4. In total, these five issues were addressed in 233 dissertations or theses (56.7%).

It could be observed, in general, an increase of studies over the years, which reflects the reality of trauma being highlighted as an augmenting cause of morbidity and mortality: the industrial era, technological development, increased speed of vehicles, socioeconomic

conditions and human nature itself are factors that contributed to the progressive growth of many different types of trauma<sup>8</sup>.

We also emphasize the importance of assessing the rate of publication of the studies analyzed in scientific journals, a suggestion for further analysis. For unpublished work is restricted to national level, sometimes limiting the advances that it could provide for both professional awareness and for investment planning and programs in trauma field<sup>20</sup>.

In summary, we perceived that the Brazilian post-graduation courses are in line with this idea, seeking to develop more and more studies that respond to everyday problems, such as trauma, a major health problem today.

We conclude that there is a significant quantity of Brazilian dissertations and theses about trauma. This reveals the importance of the theme in the current scenario, the quantitative and qualitative expansion of post-graduation programs over the years and of the concern of researches about this relevant issue that ominously afflicts national and international epidemiology: trauma.

There was relevance of Medicine, Nursing and Dentistry in the production of knowledge about trauma. It was emphasized that the promotion of experimental studies is still in its infancy in the Brazilian context, needing to be stimulated to achieve revealing levels of evidence that translate into real improvements.

It is important to note an element that hindered the analysis of theses and dissertations: the lack of standardization of abstracts available in CAPES, which sometimes hampers the understanding of the fundamental elements of a scientific study, and therefore undermines the dissemination of knowledge.

Finally, we reflect on the importance of analyzing the rate of publication of dissertations and theses in journals, vehicles for the dissemination of knowledge that enable the global spreading of study results.

## R E S U M O

**Objetivo:** Caracterizar as dissertações e teses disponíveis no Banco de Teses da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) que versam sobre a traumatologia. **Métodos:** Trata-se de uma pesquisa documental sobre a caracterização das dissertações e teses brasileiras que versam sobre a traumatologia, disponíveis no Banco de Teses da CAPES. A coleta de dados foi realizada no mês de março do ano de 2012, por mestrandos e doutores segundo protocolo de pesquisa. **Resultados:** Foram analisadas 411 dissertações e teses acerca do trauma. Elucidaram-se considerações acerca dos seguintes aspectos dos estudos selecionados: nível acadêmico, local de desenvolvimento, formação do autor, desenho metodológico, temática e tipo de trauma. **Conclusão:** O quantitativo significativo de estudos analisados revela a importância do trauma no cenário atual, a expansão dos programas de pós-graduação e a sintonia dos pesquisadores com a temática que aflige de maneira preocupante a epidemiologia nacional e internacional.

**Descritores:** Pesquisa científica e desenvolvimento tecnológico. Dissertações acadêmicas como assunto. Ferimentos e lesões. Medicina de emergência. Serviços médicos de emergência.

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