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RESEARCH

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The bicycle accident in Brazil: an integrative review

Os acidentes de bicicleta no Brasil: uma revisão integrativa

Los accidentes de bicicleta en Brasil: una revisión integradora

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ABSTRACT

Objective: To analyse the scientific production in Brazil about bicycle accidents. **Method:** An integrated revision with the aim at responding to the question: "What Scientific Knowledge was already produced in Brazil about bicycle accidents?" The data was collected in the period of June to August, 2015, at the MEDLINE and LILACS databases; articles in Portuguese and English, using the following keywords: "cycling", "Traffic Accidents", "Brazil", "Public Health", "Epidemiology", and "Mortality". **Results:** Fifteen articles were analysed and grouped in two categories: The epidemiological profile of the lesions, and the epidemiological profile of the accidents. **Conclusions:** It is highlighted that it is necessary to broaden the studies referring to this issue, in the different Brazilian States, since bicycle accidents have taken an important role in the area of Healthcare, especially for Nursing, which is planning and implementing the victims care.
Descriptors: Cycling, Traffic Accidents, Mortality, Public Health.

RESUMO

Objetivo: analisar a produção científica acerca dos acidentes de bicicleta produzidos no Brasil. **Método:** revisão integrativa com propósito de responder à questão **"**Qual o conhecimento científico já produzido no Brasil sobre acidentes de bicicleta?**"**. Os dados foram coletados no período de junho a agosto de 2015 nas bases MEDLINE e LILACS, artigos em português e inglês, utilizando-se os descritores: "ciclismo", "acidentes de trânsito", "Brasil", "saúde pública", "epidemiologia" e "mortalidade". **Resultados:** Foram analisados 15 artigos agrupados em duas categorias: perfil epidemiológico das lesões e perfil epidemiológico dos acidentes. **Conclusão:** Nota-se ser necessário ampliar os estudos referentes a este tema, nos diferentes estados brasileiros, uma vez que os acidentes de bicicleta passaram a ter papel importante no campo da Saúde, em especial para a Enfermagem, que irá planejar e implementar cuidados com as vítimas.
Descritores: Ciclistas, Acidentes de trânsito, Mortalidade, Saúde pública.

RESUMEN

Objetivo: analizar la producción científica acerca de los accidentes de bicicleta producidos en Brasil. **Método:** revisión integradora con propósito de responder a la cuestión **"**¿Cuál el conocimiento científico ya producido en Brasil sobre accidentes de bicicleta?**"** Los datos han sido recopilados en el período de junio hasta agosto de 2015 en las bases MEDLINE y LILACS, artículos en portugués e inglés, utilizándose los descriptores: "ciclismo", "accidentes de tránsito", "Brasil", "salud pública", "epidemiología" y "mortalidad". **Resultados:** Han sido analizados 15 artículos agrupados en dos categorías: perfil epidemiológico de las lesiones y perfil epidemiológico de los accidentes. **Conclusiones:** Observase ser necesario ampliar los estudios referentes a este tema, en los diferentes estados brasileños, una vez que los accidentes de bicicleta pasan a tener papel importante en el campo de la Salud, en especial para la Enfermería, que irá planificar y ejecutar cuidados con las víctimas.
Descriptores*:* Ciclistas, Accidentes de tránsito, Mortalidad, Salud pública.

INTRODUCTION

Since the nineteenth century, cycling has been an efficient and popular mode of transportation among various peoples around the world. Due to its low acquisition and maintenance costs, it can be considered as the cheapest mode of urban transportation, accessible to practically all social strata. Its use does not pollute the environment, it preserves public spaces and does not cause the annoyances that characterize the use of motor vehicles in urban areas, associated with many health benefits.[1]

For all these factors, governments and societies have been stimulating cycling as one of the alternatives for urban transportation; the so-called active transport, which are the means of transport that employs human propulsion (pedestrians, bicycles, skates...) have been gaining more supporters. [2]

Considered the world's third largest producer of bicycles, Brazil is second only to China and India, with a estimated fleet of more than 75 million units, of which approximately two-thirds of the fleet is used as a means of transporting workers.[3]

Despite all the advantages of using active transport, there is also a great deal of concern about safety issues since bicycles share the same space with cars, representing risks of accidents, especially if one considers that traffic violence represents one of the biggest causes of death in the world, particularly in developing countries, where there is an increased risk for those who use the bicycle as a means of transportation.[4]

In 2011, according to the *Inquérito* de *Vigilância de Violências e Acidentes* (VIVA, translated as Violence and Accidents Surveillance Inquiry), conducted in 105 emergency services in Brazil, 42,958 accidents were recorded. Of this total, 29% were due to traffic accidents and among them, bicycles accounted for 13.7%, standing out as the second most frequent means of locomotion among the injured, losing only to the motorcycle. [5]

In light of the above, this study aims to analyze the scientific production about bicycle accidents, produced in Brazil, through an integrative review. It is hoped that with this work, we can contribute with the researches that have been carried out on the subject, collaborating for future investigations.

METHOD

This is an integrative review. The methodological path followed these steps: problem formulation, data collection, evaluation of the data collected, analysis and interpretation of the data and presentation of results.[6]

Initially, to guide this review, the following guiding question was elaborated: "What is the scientific knowledge already produced in Brazil about bicycle accidents?" The survey was conducted through the internet, with the following databases: Medline (International Literature in Health) and Lilacs (Latin American and Caribbean Literature in Health Sciences). There was no delimitation per period. As a search strategy, the descriptors "cycling", "traffic accidents", "Brazil", "public health", "epidemiology" and "mortality" were used in the English and Portuguese languages. Material selection occurred from June to August 2015.

In order to include the articles, the following criteria were applied: texts in Portuguese, English or Spanish languages, original studies, in the format of article, developed in Brazil and that approached the bicycle accident theme, which were selected regardless of the methodology used in the survey. Exclusion criteria were: review or reflection papers, case reports, theses, dissertations and those whose abstract was not available on the online search platforms.

As a methodology to avoid duplicity of studies in the different databases, the articles found in each database were ordered by title and first author, excluding those that appeared more than once. As information from the research source, the article in which the article first appeared on the Medline database was maintained.

The review was carried out by two experienced researchers in review studies, who independently performed the selection of the studies from the analysis of the titles, abstracts and full texts of the publications. It is worth noting that the bibliographic references of the selected documents were also examined to identify and include other unidentified studies in the electronic search.

The divergences were resolved by consensus and, if not possible, by a third researcher with experience in the subject. All selected articles were obtained in the formatted full text on the CAPES portal (Coordination of Improvement of Higher Level Personnel).

In order to select the articles, the titles and detailed abstracts of the selected publications were first read with the purpose of refining the sample according to the inclusion and exclusion criteria.

Data collection allowed the identification of 643 studies, of which 625 in the Medline database and 18 in the Lilacs database. Of the 643 studies, 17 were excluded because they were repeated in more than one database. In addition, 605 studies performed outside Brazil were excluded from the sample. Of the 21 studies selected for reading in full, 04 studies were excluded because they were review/reflection studies and after a more detailed analysis, two other articles were excluded because they were carried out outside Brazil, which allowed the selection of 15 studies, which had relation with the subject in question (Figure 1). These studies were published between 1997 and 2013. After screening, the studies were coded with an alphanumeric sequence (E1, E2, E3 and so on) in order to facilitate identification.

Then, a data collection form was prepared, containing information on: author/year, journal in which it was submitted, region, objectives, type of study, data sources and main results. The level of evidence was discussed among the authors and assigned based on the proposed classification[6]: level I - evidence from meta-analysis of randomized controlled trials; level II - evidence obtained from an experimental study; level III - evidence obtained from quasi-experimental research; level IV - evidence from a descriptive study or qualitative methodological approach; level V - evidence obtained from case reports or experience reports; level VI - evidence based

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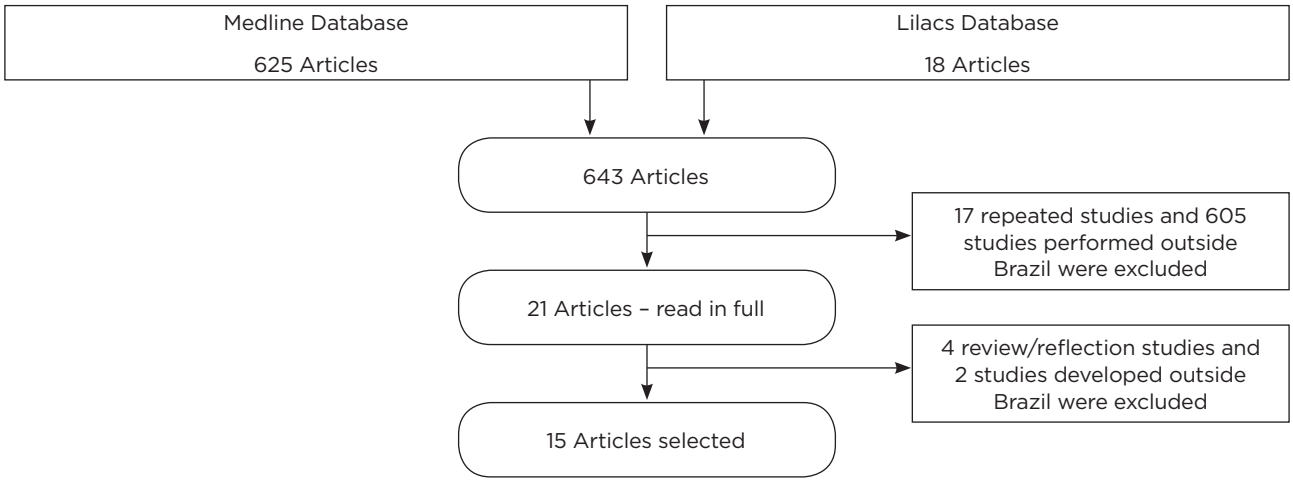
on expert opinions or on the basis of standards or legislation. The analysis of the data was made through descriptive statistics and presented through figures and tables.

Figure 1 - Flowchart of the integrative review of the scientific production of bicycle accidents in Brazil.



RESULTS AND DISCUSSION

In the present integrative review, 15 articles that met the inclusion criteria were analyzed, as presented in the Table 1.

Table 1 - Identification of the study sample, according to code / year, author (s), title and objective (s), Vitória / ES, Brazil, 2015.

Code and Year of the Article	Author	Title	Goals
E1 [7] 2013	Almeida RLF, et al.	*Via, homem e veículo: fatores de risco associados à gravidade dos acidentes de trânsito.*	To analyze the characteristics of the victims, highways and vehicles involved in traffic accidents and the risk factors of accidents with death.
E2 [8] 2013	Galvão PVM, et al.	*Mortalidade devido a acidentes de bicicletas em Pernambuco, Brasil.*	To analyze the cases of death in bicycle accidents in Pernambuco between 2001 and 2010.
E3 [9] 2013	Nardis AC, et al.	Patterns of paediatric facial fractures in a hospital of São Paulo, Brazil: a retrospective study of 3 years.	To analyze the pattern of facial fractures in children from 0 to 12 years of age treated at the Oral and Maxillofacial Surgery Service of Vila Penteado General Hospital, São Paulo, Brazil.
E4 [10] 2012	Chandran A, et al.	Road traffic deaths in Brazil: rising trends in pedestrian and motorcycle occupant deaths.	To detail the epidemiological profile of deaths due to traffic accidents in Brazil according to categories of vulnerable road users.
E5 [11] 2012	Paes JV, et al.	Retrospective study of prevalence of face fractures in southern Brazil.	To investigate the prevalence of facial fractures in the South of Brazil between 2003 and 2008.
E6 [12] 2010	Santos SES, et al.	A 9-year retrospective study of dental trauma in Piracicaba and neighboring regions in the State of São Paulo, Brazil.	To evaluate the occurrence of dental-alveolar trauma during 9 years in the Division of Oral and Maxillofacial Surgery, School of Dentistry, Piracicaba, São Paulo, Brazil.
E7 [13] 2010	Chrcanovic BR, et al.	Facial fractures in children and adolescents: a retrospective study of 3 years in a hospital in Belo Horizonte, Brazil.	To investigate the etiology, incidence and treatment of oral and maxillofacial fractures in children in Belo Horizonte, Brazil.
E8 [14] 2010	Bacchieri G, et al.	Cycling to work in Brazil: users profile, risk behaviors, and traffic accident occurrence.	To describe and analyze variables related to the profile, the use of safety equipment and risk behavior among workers who use the bicycle as a means of transport.
E9 [15] 2010	Bacchieri et al.	*Intervenção comunitária para prevenção de acidentes de trânsito entre trabalhadores ciclistas.*	To evaluate the impact of educational intervention on safety and prevention of traffic accidents among cycling workers.

Code and Year of the Article	Author	Title	Goals
E10 [16] 2009	Sawazaki R, et al.	Incidence and patterns of mandibular condyle fractures.	To evaluate the epidemiological characteristics of the prevalence, type and treatment of mandible fractures.
E11 [17] 2008	Gulinelli JL, et al.	Occurrence of tooth injuries in patients treated in hospital environment in the region of Araçatuba, Brazil during a 6-year period.	To analyze the characteristics and occurrence of dental lesions.
E12 [18] 2005	Bacchieri G, et al.	*Determinantes e padrões de utilização da bicicleta e acidentes de trânsito sofridos por ciclistas trabalhadores da cidade de Pelotas, Rio Grande do Sul, Brasil.*	To present the determinants and the patterns of use of the bicycle among the workers who use it as a mode of transportation and describe the accidents suffered.
E13 [19] 2003	Barros AJD, et al.	*Acidentes de trânsito com vítimas: sub-registro, caracterização e letalidade.*	To describe the traffic accidents and compare the risks of injury and death of different types of vehicles and pedestrians.
E14 [20] 1998	Scalassara MB, et al.	*Características da mortalidade por acidentes de trânsito em localidade da região Sul do Brasil.*	To characterize the fatal victims of traffic accidents, according to variables related to the accident victims and to analyze the circumstances in which such accidents occurred.
E15 [21] 1997	Gonçalves RM, et al.	*Características das pessoas envolvidas em acidentes com veículos de duas rodas.*	To characterize the victims of accidents with two-wheeled vehicles.

Of the total of 643 articles captured in the databases defined in this review, 605 (94%) were held outside Brazil. Of the 15 articles analyzed in our study, we noticed that these were published in nine different journals, among which we highlight those in the area of public/collective health [7,8,15,18,19,20,21] who collaborated with 46.6% of the researches and those of oral and maxillofacial surgery and traumatology, [9,11,12,13,16,17] that represented 40% of the sources of information. Two articles were published in journals related to urban traffic engineering and safety [10,14] (13.4%).

Regarding the year of publication, most of the studies were published in 2010, totaling four surveys[12,13,14,15] and accounting for 26.6% of the total sample and in the year 2013 with three publications, [7,8,9] participating with 20% of the published works.

Regarding the region of the research, the studies were concentrated in the South (40%), totaling six studies [11,14,15,18,19,20] ,of which 66.6% were performed in Pelotas[14,15,18,19] and Southeast (40%) also with six studies[9,12,13,16,17,21], highlighting the studies carried out in São Paulo[9,12,16,17]. The Northeast region contributed with two studies[7,8] (13.3%) and there was a study that considered Brazil as a analysis unit[23], corresponding to 6.6%.

When analyzing the approach, it was identified that all the researches[7-21] were observational studies, of which 9 studies (60%) were within Level III of evidence[7,8,11,13,14,15,16,17,19] and 6 studies (40%) were within level IV of evidence[9,10,12,18,20,21].

The publications were produced from different sources of information. It is noted that 80% of the studies used secondary data, of which 6 studies (40%) performed a patient chart analysis[9,11,12,13,16,17]; in three studies (20%) the data were collected from the Mortality Information System[7,8,10] and three studies (20%) analyzed the Military Police incident reports[19,20,21]. Three studies (20%) did not use secondary data as a source of information, which was obtained through a structured interview[14,15,18].

When analyzing the studies, in order to answer the guiding question: "What scientific knowledge has already been produced in Brazil concerning bicycle accidents?", the following thematic categories emerged: epidemiological profile of lesions; epidemiological profile of accidents and behavior, educational and safety interventions (Table 2).

Table 2 - Distribution of the thematic categories according to the study codes and the present percentage of each category, Vitória / ES, Brazil, 2015.

Thematic Category	Study Code	%
Epidemiological profile of lesions	E3, E5, E6, E7, E10, E11	4 0
Epidemiological profile of accidents	E1, E2, E4 , E13, E14, E15	40
Behavior, educational and safety interventions	E8, E9, E12	20

The first category, called epidemiological profile of the lesions, is present in six studies (40%) (E3, E5, E6, E7, E10, E11); (E1, E2, E4, E13, E14, E15); the second category, called epidemiological profile of accidents, refers to studies that characterize bicycle accidents, present in six (40%) studies (E1, E2, E4, E13, E14, E15) and the category behavior, educational and safety interventions is present in three (20%) of the analyzed publications (E8, E9, E12).

Considering the current context of health promotion and urban mobility, in which the use of bicycles has been increasingly stimulated and presents itself as an excellent strategy in reducing risk factors for illness and a good option for people's transport, there seems to be few Brazilian studies dedicated to the study and identification of the characteristics of these accidents. This fact leads us to

question: are there few occurrences in Brazil, or are these accidents still veiled by a misconception of lesser gravity and less importance, thus not deserving investment in research?

Of the total of 643 articles captured in the databases defined in this review, 605 (94%) were performed outside Brazil, which seems to indicate that the problem of bicycle accidents exists, but has not yet made a point of analysis for Brazilian researchers. Between 1997 and 2013 (16 years) we located fifteen articles made in Brazil. In any case, interest in this type of accident has been present since 1997, as demonstrated by a study carried out in the city of Belo Horizonte, already bringing this problem in the context of the morbidity and mortality of traffic accidents in that region[21].

Regarding the thematic category epidemiological profile of lesions, it is noteworthy that the studies were performed in their entirety by dental surgeons, whose main objective was to investigate the oral and maxillofacial traumatic lesions of patients treated at buco-maxillofacial surgery centers.[9,11,12,13,15,17]

Facial fractures are important due to their physical, emotional and socioeconomic consequences [22] and in this context, the studies [9,11,12,13,15,17] performed by these surgeons totaled an analysis of 11457 medical records of patients who were victims of trauma between 1999 and 2011.

These studies evidenced that among the several etiologies of these traumas, bicycle accidents were the first [12,16,17] , second [13] and third causes [9.11] of injuries, with emphasis on the population of children, adolescents and young adults as the most affected groups.

The dental and dentoalveolar lesions [12,17], as well as the nasal and mandibular fractures [9,11], were the most common types of facial traumas. In terms of treatment, most of these patients required surgery, as presented in the study entitled "Patterns of pediatric facial fractures in a hospital in São Paulo, Brazil: a retrospective study of 3 years" in which 38% of the victims required surgery. [9]

Another finding worth mentioning is the seasonal pattern of the occurrence of these traumas caused by bicycle accidents. The intense outdoor social activity stimulated in the spring and summer periods seems to have contributed to the increase in the number of accidents[11] , as well as the days of Friday, Saturday and Sunday as days of higher incidence of accidents and respective injuries. [12]

The number of cyclists is large and has increased in recent decades, both in small and inland cities, and in metropolises where bicycles are often used as a means of transportation to school and work. [12]

It is also worth noting that these lesions require different treatments, often with hospital admissions for surgical procedures and follow-up, the application of reconstructive metal plates, antibiotic therapy, requiring in most cases the patient's withdrawal from work and social activities, accompanied by suffering and pain, with repercussions on food habits and oral communication [9,17] , implications that are directly related to nursing care.

In this review, there is a great urgency to develop studies capable of clarifying the various other types of injuries that affect victims of bicycle accidents since it is possible to assume that other segments of the body, besides the facial regions, can also be affected if one considers the body exposure of cyclists in the use of bicycles, representing a large gap and a field of research for emergency and trauma nursing.

Such studies will contribute to characterize the severity of the injured in order to intervene with measures to protect cyclist road users, in the early diagnosis and appropriate treatment of injuries, including the Nursing Science in all stages of intervention.

Regarding the epidemiological category of accidents, it is worth noting that in the majority of the cases (66%), the main objective was not to analyze bicycle accidents and their characteristics, but to characterize traffic accidents in general, so that cycling accidents emerged as one of the categories among the various types of traffic accidents [7,10,20,21]. Only one article (20%) was devoted to the study of mortality due to bicycle accidents, carried out in Pernambuco [8] and another article (20%) characterized accidents with two-wheeled vehicles.[20]

The bike has three characteristics that are extremely timely and valued in any city in the world: besides having a low cost for purchase and maintenance, it does not emit pollutants and benefits the health of its driver. In this context, it ceases to be a means of locomotion of low income people and reaches the middle class, driven not only by the aspect of transportation ease and health gain, but also by the reduction of environmental impact. [3]

However, in contrast to the healthy use of the bicycle as a mode of transport, sports or leisure activity, traffic accidents involving cyclists are frequent in several countries, causing deaths and disabilities, especially in children and young adults[18].

The vulnerability of cyclists was reinforced in our review. The risk of dying in traffic among those who used bicycles was greater when compared to those who used cars or trucks.[7]

It has been verified that mortality due to bicycle accidents has shown a slight increase in mortality coefficients in the last decades, reaching mainly young men and young adults [8,10,19] which corroborates with studies that indicate a higher prevalence of deaths due to external causes in this population. [23]

Another finding worth mentioning is underreporting of cases. The study entitled "Traffic Accidents with Victims: Underreporting, Characterization and Lethality " showed that cycling was underreported in 32.9% of the cases, 47% did not know the vehicle they ran over and 20% of motorists fled of the place after hitting the cyclist. [19]

Such findings seem to reveal the existence of a trivialization culture of bicycle accidents, which reflects in the lack of road safety and in the difficulty of adequate supervision of the growing relation between cyclists and runways.

In the Behavior, Education and Safety Interventions category, our review revealed that men use cycling more frequently than women, especially on commuting. Gender, economic status and schooling seem to be the main determinants of bicycle use. [18]

Workers of lower social levels see in the bicycle a way of saving on the costs of acquiring and maintaining a car or even in relation to public transport and use the bicycle for at least five days a week, with an average of 57 minutes of travel daily, even in unfavorable weather conditions such as very cold days, too much heat or rainy days. [14,18] It is important to reflect that if unfavorable weather conditions contribute to increasing the risk of traffic accidents with cars, such a situation would be no different for cyclists.

The low prevalence of the use of mandatory safety equipment deserves special attention because they identify a low level of knowledge of the population regarding these standards and less access to sufficient income to equip or keep their bicycle in good conditions of safe use. [18]

A research developed as the objective of analyzing the impact of educational intervention on the prevention of accidents and promotion of the use of safety equipment involving 1133 male individuals who used the bicycle as a means of transportation come and go from work concluded that isolated educational programs , aiming only to modify the behavior of the individual, are not effective in the reduction of accidents, since other factors, such as road conditions and traffic are presented as the main determinants for their occurrence. [15]

FINAL CONSIDERATIONS

In conclusion, the present integrative review enabled the elaboration of a synthesis of the scientific knowledge about bicycle accidents in Brazil, whose aspects to be highlighted were low scientific production on the subject, requiring studies to elucidate the broad spectrum of factors related to this type of accident, under which conditions occur and what are their impacts on the current profile of Brazilian morbidity and mortality.

It is also important to emphasize that among the studies, only four had the object of bicycle accidents; in the other studies, accidents arose as a consequence of the analysis of traffic accidents in general and analysis of maxillofacial and dental trauma and lesions, in which bicycle trauma is shown to be an important cause of injury, not only in children.

Thus, it is clear the importance of investigating other possible consequences of such accident since it is acceptable to assume that other segments of the body are also affected at the time of trauma.

It is clear that, while important, isolated educational actions are not enough to reduce accident numbers, so that improvement actions in road infrastructure, increasing the cycling network and the effective implementation of legislation, systematic and comprehensive monitoring can difference in the reduction of this type of trauma.

It was possible to identify the inexistence of studies on this subject in the north and center-west regions of Brazil, with the largest production concentrated in the south and southeast regions. In view of the gaps and the findings evidenced in this study, it is necessary to expand the studies related to this topic, in the different Brazilian states, since bicycle accidents have an important role in the field of Health, especially for Nursing, who will plan and implement care for the victims.

REFERENCES

1. Oja P, Titze S, Bauman A, et al. Health benefits of cycling: a systematic review. *Scand J Med Sci Sports* 2011;21(4):496-509.
2. Carvalho ML, Freitas CM. Pedalando em busca de alternativas saudáveis e sustentáveis. *Ciência & Saúde Coletiva* 2012; 17(6):1617-1628.
3. Abraciclo – Associação Brasileira dos fabricantes de motocicletas, ciclomotores, motonetas, bicicletas e similares. Anuário 2014 [Internet]. [cited 2015 jun 19]. Available from: http://abraciclo.com.br/anuario-2014.
4. Teschke K, Brubacher JR, Friedman SM. Personal and trip characteristics associated with safety equipment use by injured adult bicyclists: a cross-sectional study. *BMC Public Health* 2012; 12(765): 1-9.
5. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Vigilância de Doenças e Agravos não Transmissíveis e Promoção da Saúde. Sistema de Vigilância de Violências e Acidentes (Viva): 2009 2010 e 2011/Ministério da Saúde, Secretaria de Vigilância em Saúde, Departamento de Vigilância de Doenças e Agravos não Transmissíveis e Promoção da Saúde. – Brasília: Ministério da Saúde, 2013.164 p.: il.
6. Souza MTS, Silva MD, Carvalho R. Revisão integrativa: o que é e como fazer? Einstein. 2010; 8(1Pt1):102-6.
7. Almeida RFL, Filho JGB, Braga JU, Magalhães FB, Macedo MCM, Silva KA. Via, homem e veículo: fatores de risco associados à gravidade dos acidentes de trânsito. Rev Saúde Pública 2013;47(4):718-31.
8. Galvão PVM, Pestana LP, Pestana VM, Spíndola MOP, Campello RIC, Souza EHA. Mortalidade devido a acidentes de bicicleta em Pernambuco, Brasil. Ciência & Saúde Coletiva, 18(5):1255-1262, 2013.
9. Nardis AC, Costa SAP, Silva RA, Kaba SCP. Patterns of paediatric facial fractures in a hospital of São Paulo, Brazil: a retrospective study of 3 years. Journal of Cranio-Maxillo-Facial Surgery 41 (2013) 226-229.
10. Chandran A, Souza TRV, Guo Y, Bishai D, Pechansky F. Road traffic deaths in Brazil: rising trends in pedestrian and motorcycle occupant deaths. Traffic Injury Prevention, 13(s1):11-16, 2012.
11. Paes JV, de Sá Paes FL, Valiati R, de Oliveira MG, Pagnoncelli RM. Retrospective study of prevalence of face fractures in southern Brazil. Indian J Dent Res 2012;23:80-6.
12. Santos SE, Marchiori EC, Soares AJ, Asprino L, Filho FJS, Moraes M, et al. Retrospective study of prevalence of face fractures in southern Brazil. J Oral Maxillofac Surg 68:1826-1832, 2010.
13. Chrcanovic BR, Abreu MHNG, Freire-Maia B, Souza LN. Facial fractures in children and adolescents: a retrospective study of 3 years in a hospital in Belo Horizonte, Brazil. Dental Traumatology 2010; 26: 262–270.
14. Bacchieri G, Barros AJD, Santos JV, Gigante DP. Cycling to work in Brazil: users profile, risk behaviors, and traffic accident occurrence. Accident Analysis and Prevention 42 (2010) 1025–1030.
15. Bacchieri G, Barros AJD, Santos JV, Gonçalves H, Gigante DP. Intervenção comunitária para prevenção de acidentes de trânsito entre trabalhadores ciclistas. Rev Saúde Pública 2010;44(5):867-76.
16. Sawazaki R, Júnior SML, Asprino L, Moreira RWF, Moraes M. Incidence and patterns of mandibular condyle fractures. Oral Maxillofac Surg 68:1252-1259, 2010.
17. Gulinelli JL, Saito CTMH, Garcia-Júnior IR, Panzarini SR, Poi WR, Sonoda SK, et al. Occurrence of tooth injuries in patients treated in hospital environment in the region of Araçatuba, Brazil during a 6-year period. Dental Traumatology 2008; 24: 640–644.

18. Bacchieri G, Gigante DP, Assunção MC. Determinantes e padrões de utilização da bicicleta e acidentes de trânsito sofridos por ciclistas trabalhadores da cidade de Pelotas, Rio Grande do Sul, Brasil. Cad. Saúde Pública, Rio de Janeiro, 21(5):1499-1508, set-out, 2005.
19. Barros AJD, Amaral RL, Oliveira MSB, Lima SC, Gonçalves EV. Acidentes de trânsito com vítimas: sub-registro, caracterização e letalidade. Cad. Saúde Pública, Rio de Janeiro, 19(4):979-986, jul-ago, 2003.
20. Scalassara MB, Souza RKT, Soares DFP. Características da mortalidade por acidentes de trânsito em localidade da região Sul do Brasil. Rev. Saúde Pública, 32 (2): 125-32, 1998.
21. Gonçalves RM, Petroianu A, Júnior JRF. Características das pessoas envolvidas em acidentes com veículos de duas rodas. Rev. Saúde Pública, 31 (4): 436-7, 1997.
22. Manganello Luiz C., Silva Alexandre A. F.. Fraturas do côndilo mandibular: classificação e tratamento. Rev. Bras. Otorrinolaringol. [Internet]. 2002 Oct [cited 2015 jun 19] ; 68(5): 249-255. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-72992002000500023&lng=en. http://dx.doi.org/10.1590/S0034-72992002000500023.
23. Neto PFV, Siqueira BPJ, Nery AA, Casotti CA. Tendência da mortalidade masculina por causas externas. J Nurs UFPE on line [Internet]. 2015 Octub [cited 2015 Octub 28];9(5):7877-86. Available from: http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/view/7016/pdf_7821

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