Review Article

Educational interventions on prevention of accidents in preschool children: integrative review

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ABSTRACT

Trampling, drowning, falls, wounding and burns are the most prevalent accidents in preschool children. Caregivers, teachers and health professionals involved in the care of these children must focus on prevention actions. The objective of this study was to investigate the educational interventions for preventing accidents in preschool children described in the scientific literature. Integrative review carried out in the databases Scopus, Web of Science, CINAHL, Medline, LILACS, IBECS, BDENF, CUIDEN and in the Cochrane library, using the descriptors health education, accident prevention and preschool. Nineteen studies were selected, 13 of which included caregivers as target public. Games, videos, informative materials, counseling and lectures were the educational technologies most used. It was showed that, considering the target public socio-demographic and cultural context, the adequate selection of the pedagogical approach and of the educational technology can promote a better effect on the knowledge in the educational interventions about the accidents prevention.

Descriptors: Health Education; Child Rearing; Child, Preschool; Accident Prevention; Pediatric Nursing.

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INTRODUCTION

The Pan-American Health Organization (PAHO)[1] recommends that during the childhood period it must be insured that the healthy growth and development of children by promoting the health and reducing the morbidities and disabilities, in which the unintentional accidents are also included. Accidents are unintentional and avoidable events causing physical and/or emotional injuries sourced in domestic or social environment [2].

"In the world, more than a million children die every year due to unintentional accidents. In Brazil, the same are the leading cause of death of children and adolescents under 14 years with 3,800 deaths and 116 thousand hospitalized children per year[3-4]." The accidents may be predictable and liable to primary, secondary and tertiary prevention through actions to contribute to reducing the incidence, prevalence and the severity of the damages occasioned by injuries to the child [5-6].

In Brazil, traffic accidents, drownings, suffocations, falls, burns and intoxications are among the main causes of accidents in childhood. In the year of 2014, the traffic accident was the main cause of death between children and adolescents (**one -14 years) covering 39% of the cases [7]**. According to the Database of Brazilian Unified Health System´s (Sistema Único de Saúde [SUS]) Department of Informatics (DATASUS) in the same year, as regards the data on morbidity for accidents between children and adolescents (one- 14 years), were 49% for falls, 17% burns, 11% traffic accidents, 3% intoxication and 20% for other causes (traumas, drowning, etc.)[8].

Traffic accidents, falls, burns and other accidents (wounding, accidents with animals, traumas) are the most prevalent accidents in preschool children (two to six years of age), mainly aged from two to five years [9]. In this context, the parents, relatives, education and health professionals involved in the different children´s interaction spaces such as home, school, park, day nursery/preschool/childhood education center or core, among others, must be vigilant and adopt actions of preventing accidents by recognizing the different risk and protection factors [6].

In Brazil, the Ministries of Health and of Education, through the Health in Schools´ Program (PSE), link the professionals from the primary health care and education to develop health promotion strategies, including preventing diseases and damages and the attention to health to face the vulnerabilities, accidents and/or violence, that compromise children´s development [10].

From among the professionals from the primary health care, the nurse plays an essential role in the change of healthy behaviors and habits along with the community, through educational actions about the ways of prevention of diseases and damages [11]. The adoption of educational interventions with the families and community for the promotion of safety in the social spaces may favor the reduction and risks for accidents [8].

The promotion of educational interventions regarding the accidents prevention in preschool is timely, since in this age group, ranging from 24 to 59 months of age [9], the children increase their social and motor skills, by exploring more the environments, driven by curiosity, inability to prevent danger situations due to the cognitive and motor development in formation, as well as limitations in bodily and space notion and lack of fine motor coordination [12].

In this light, the aim of this study was to investigate the educational intervention for prevention of accidents in preschool describe in the scientific literature.

METHOD

Integrative review elaborated with six distinct steps: (1) Identification of the problem/formulation of the key question of the study; (2) Sampling/literature search; (3) Study categorization /data collection; (4) Data analysis; (5) Discussion/result interpretation and (6) Presentation of the integrative review [13].

The following research question was used: Which are the educational interventions for preventing accidents in preschool children described in scientific articles available in electronic media?

The search was carried out in June 2018 by two researchers separately by using the Descriptors in Health Science (DeCS) and their translations standardized by the *Medical Subject Heading* (MeSH), by means of uniterms isolated or combined with the Boolean operator "*and*" in Portuguese, English and Spanish languages: "educação em saúde/*health education*/educación em salud", "prevenção de acidentes/*accident prevention*/prevención de accidentes" e "pré-escolar/*child preschool*/preescolar".

The Medical Literature Analysis and Retrieval System on-line (Medline), Elsevier API (Scopus), Web of Science, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Latin-american and Caribbean Health Sciences (LILACS), Nursing database (BDENF), Bibliographical Science in Health Sciences (IBECS), Index Foundation (CUIDEN) and the Cochrane Library were the databases researched.

Original studies, published in Portuguese, English and Spanish idioms, without establishing a time limit for publication were adopted as the inclusion criteria. Research abstracts, case reports, newspaper articles, literature review, theoretical reviews, theses and dissertations were the exclusion criteria. The crossing of descriptors *health education*, *accident prevention* and *child preschool* in the databases resulted in 1,010 studies.

For selecting the sample, the titles and/or abstracts of the 1,010 studies were read and selected 55 that were in line with the key question. Of these, 11 studies were in duplicate in two or more databases, totaling 44 studies. Among the pre-selected studies, 20 were excluded, five for being review or discussion articles, a book, an editorial and 13 in other idioms, resulting on a sample of 24 studies for reading in full and obtaining data (Figure 1).

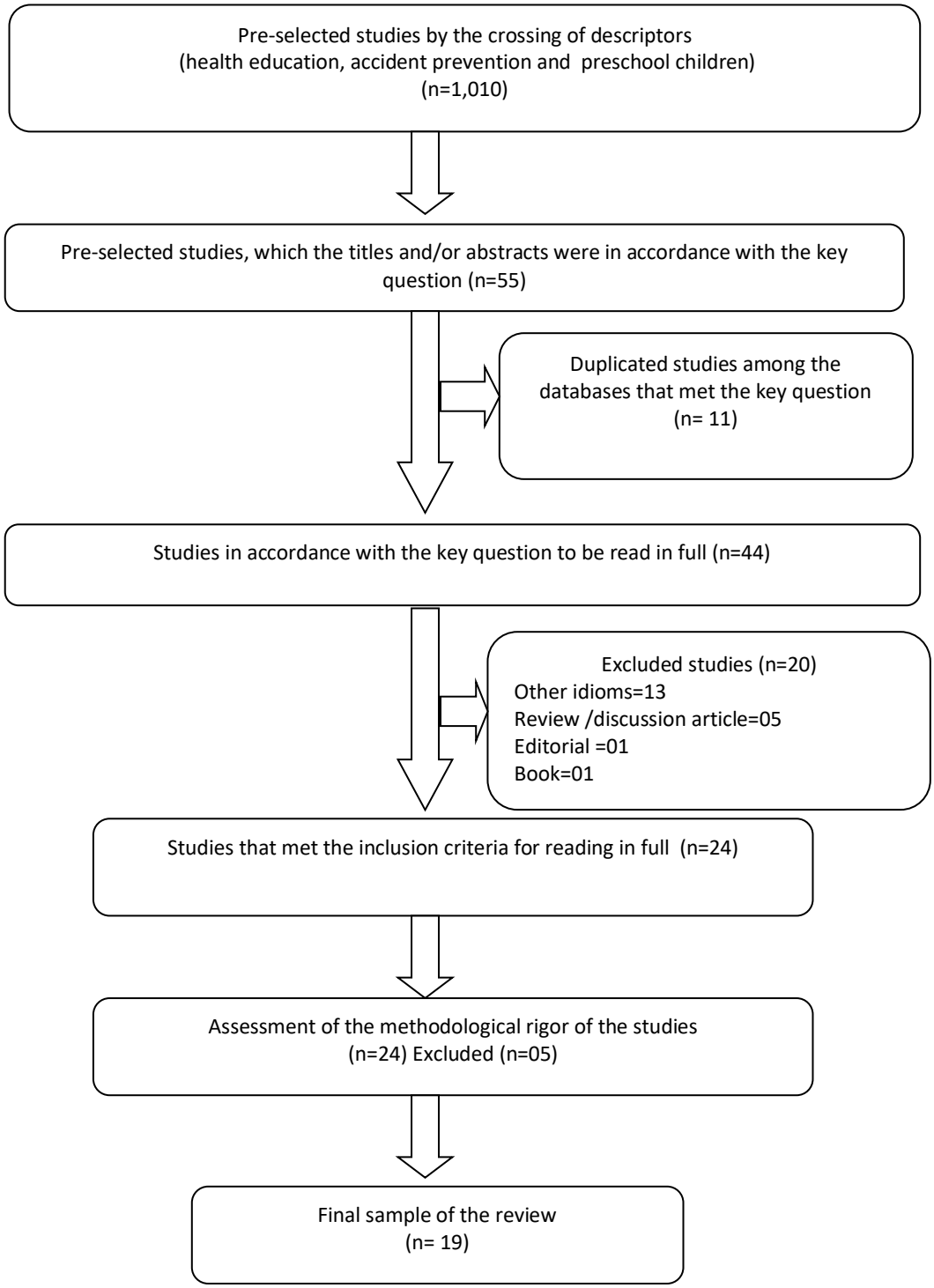
The data were collected using the instrument proposed by Ursi that contemplates title, periodical (year, volume, number and pages), authors, and type of publication, methodological characteristics, objectives, objectives, sample, data treatment, results, and conclusions [14]. The studies were assessed as for the methodological rigor by an instrument adapted from the *Critical Appraisal Skills Programme* (CASP) with 10 items attributable as for the study objectives, clarity in the description of the methods used, participants´ definition, inclusion/exclusion criteria, and fulfilment of the ethical aspects, data collection, analysis process, results and limitations [15]. This instrument categorizes the studies into: level A (6 - 10 points) – good methodological quality and reduced bias; level B (up to 5 points) – adequate methodological quality, but increased risk of bias. Five of the 24 studies were excluded, since they were classified as level B, reaching a final sample of 19 studies.

As for the evidence level the studies were analyzed by the hierarchical classification according to the methodological approach adopted, distributed in seven levels:

- Level I (systematic reviews or meta-analysis);
- Level II (randomized controlled clinical trials);
- Level III (non-randomized clinical trials);

- Level IV (cohort studies or case-control);
- Level V (systematic reviews of descriptive and qualitative studies);
- Level VI (descriptive or qualitative studies);
- Level VII (authorities opinions and/or committees on specialties reports)[16].

Figure 1: Flow chart of sampling and studies selection of the integrative review.



The studies were grouped according to the target public selected for the educational intervention about prevention of accidents-caregivers; caregivers and preschool children; and preschool children. The term

"caregivers" comprises the parents or responsible and relatives of the child. To analyze and discuss the results the scientific literature was used about the pedagogical approaches in educational interventions [17-18].

RESULTS

Of the 19 studies, 12 met the level of evidence II[19-30], five met level III[31-35] and two level VI[36-37]. Most educational interventions was directed at the caregivers [19-25,31-33], followed by the preschool children [28-30,34-35,37], caregivers and preschool children[26-27,36]. The locations selected to carry out the educational interventions were schools[26-31,34-35,37], hospitals[19,21,23,32], homes[25,33], communities[20,22,28,36] and home/community[24].

The technologies evidenced in the studies were videos, informative materials, letter, posters, illustrations, interactive computers, simulation games [19,21-23,25-30,32-34,36-37]. Of these studies, two[33,36] that used informative materials with lectures and one [26], the application of an educational video for the families, did not yield satisfactory results among the caregivers.

The Chart 1 summarizes aspects of the studies selected and included in the review by describing information about author/year, database, objectives, method/resource used/location of the study and main results. The articles have also been separated according to the target public involved in the educational interventions.

Chart 1: Distribution of the studies according to the categories addressed, databases, objectives, method/resource used/location of the study and main results.

Author / Year / Country / Databases	Objectives	Method / Resource used / Location of the study	Main results
Educational interventions with caregivers			
Gittelman et al. / (2014) / United States/ Scopus, Cochrane Library	To determine whether a computerized kiosk of a Pediatric Emergency department is capable of selecting relative with risk of accidents and encourage them to adopt safety measures compared with an intervention carried out by specialist in accidents prevention.	**Method:** Randomized clinical trial. **Resource used:** In the intervention Group (GI) instructions of behavior were carried out, mediated by computerized kiosk placed in the hospital for the parents/ responsible of children assisted in the Pediatric Emergency, compared with an educational intervention (informative materials) with specialist in prevention of lesions for the parents/responsible of the control group (CG). **Location:** Hospital	The families who received the educational intervention by a specialist improved the answers of safe behaviors (8.3%) in relation to those who received instructions from the computerized kiosk (1%). There has been significant improvements in relation to the use of safety equipment by the GC (36%) compared with the GI (23%).
Cheraghi et al./ (2014) / Irã/ Scopus	To assess the effect of the Health Belief Model about the mothers´ education to promote the safety and prevention of lesions among children under five years old.	**Method:** Randomized clinical trial. **Resource used:** Intervention based on the educational program (Health Belief Model) (four sessions/1h/2x/week). **Location:** Community	The difference of the means after the intervention, between the two groups was 3.98 as for the knowledge and 47 in relation to the practice. The differences were statistically significant (P=0.001).
Shields Wendy et al./ (2013) / United States/ Medline	To assess the impact of an intervention of a computerized kiosk in the self-report of the parents´ knowledge and observation of the behavior about safety in the child seat on vehicles, smoke alarm and safe storage of poison.	**Method:** Randomized clinical trial. **Resource used:** personalized safety information (GI) compared to generic information about the child´s health (GC) for parents/responsible of children assisted in a pediatric trauma center. **Local:** Hospital	The GI reached significantly more knowledge on the smoke alarm (82%), poison storage (83%) and correct use of safety seats. There was discrepancy among the behavior observed at home after the test regarding the self-report by the parents in the kiosk computerized.
Swartz et al./ (2013) / United States / Medline	To assess the parents´ learning about how to keep the baby safe in the car through a multimedia DVD aimed to improve the knowledge about the car seat installation.	**Method:** Randomized clinical trial. **Resource used:** Multimedia DVD that lasts 45minutes (GI) versus introductory multimedia (only one part of the DVD), without information about the child´ safety in the car (GC). Measurement by simulation test. **Location:** Communitarian centers	The scoring in the post-test were significantly higher in the GI than the GC as for the knowledge and simulation of the car seat ($p<0.001$).
Shenoi et al./ (2010) / United States / Cochrane Library, Medline, Scopus, CINAHL	To test the impact of an educational video for improving the knowledge about the passenger´s safety (child).	**Method:** Randomized clinical trial. **Resource used:** Educational video. **Location:** Hospital	There were no statistical difference between the GI and GC as for the demographic variables and to the safety characteristics of the passenger (child). However, there was improvement of the scoring, (0.65) between the GI and GC.

Author / Year / Country / Databases	Objectives	Method / Resource used / Location of the study	Main results
Moran Stanley / (2006) / New Zealand / Medline	To develop an educational program for parents about the children´s water safety.	**Method:** Randomized clinical trial. **Resource used:** Intervention based on an educational program. **Location:** Swimming school	There was a significant improvement in the parents´ understanding after the program, except for Cardiopulmonary Resuscitation (CPR). The water safety as the parents´ main reason to enroll their children passed from 16% to 24% after the intervention.
Powell et al./ (2000)/ United States/ Medline	To compare an orientation by pictorial anticipatory leaf (PAG) (leaflet with images and orientations), requiring limited reading abilities, with a Program of Injury Prevention (TIPP) to provide information about injury prevention for low income urban families.	**Method:** Controlled clinical trial. **Resource used:** Educational intervention with PAG by a nurse (GI) and TIPP (GC). **Location:** Hospital (outpatient)	Most parents reminded the information they have been given on the accidents (87% of GI and 100% of GC) after period between 14 to 28 days. However, at least half of any of the groups reminded no specific topic addressed. There was no significant difference among the groups about the memories regarding the accidents addressed (burns, falls, wounds from arms and drowning).
Schwaz et al. / (1993) / United States / Scopus	To assess the impact of a study of the Safe Block Project in Philadelphia about the prevention of injuries and domestic in the knowledge of a power and urban African-American.	**Method:** Randomized clinical trial. **Resource used:** Inspection of the house with modifications regarding the safety and educational intervention about practices of prevention (GI). **Location:** Home and community	The houses of GI had a bigger significant as for the knowledge and safety of the prevention instruments regarding the GC. There was difference as for the domestic dangers that would require great changes.
Sangvai Shilpa et al. (2007)/ United States / Scopus	To determine the feasibility and effectiveness of an approach of model of attention to prevent injuries compared with a standard anticipatory orientation.	**Method:** Controlled clinical trial. **Resource used:** educational intervention with counseling, delivery of educational leaflet and safety equipment (smoke detectors; locks and offices for safe weapons storage, cleaning products and medicines; cards to measure the temperature of water); assessment of the car seat (GI); Standard medical orientation (GC). **Location:** Home	No differences were observed among the evaluated groups (p=0.6).
Posner et al./ (2004)/ United States/ CINAHL	To assess the effectiveness of a safety intervention at home in the caregivers´ behaviors and practices in an Emergency department.	**Method:** Randomized clinical trial. **Resource used:** Verbal counseling of the informative material and delivery of a kit of home safety (GI) and delivery of the safety device (GC). **Location:** Home	The GI presented significant increase in the scoring of the global mean about the safety measures (burns, poisoning and wounds) (73.3%) regarding the control group (66.8%). The educational action and the safety devices were effective for the improvement of the caregivers´ practice.

Author / Year / Country / Databases	Objectives	Method / Resource used / Location of the study	Main results
Educational interventions with preschool children and caregivers			
Zeedy, Wallace/ (2003)/ England/Scopus	To determine whether a video had an impact on the children´s and parents´ knowledge regarding the abilities and safety for walkers.	**Method:** Randomized clinical trial. **Resource used:** Educational video given to the families (GI) versus lack of the video with the educational material (GC). **Location:** School	The video used, in most of the time once a day, have no impact on the parents´ knowledge of GI, according to ANOVA analysis (passed from M=4.88 to M=4.82, in scale from 0 to 5) and in the children (from M=2.81 to M=2.85). For the parents, the video was considered an effective educational support (M=4.33), despite the non- statistically significant results identified in the study.
Bowman et al./ (1987)/ Australia/ Scopus, Cochrane Library	To implement and compare the effectiveness of two interventions to increase the knowledge about the use of the safety seat of preschool children.	**Method:** Randomized clinical trial. **Resource used:** Coercive intervention for the parents through a letter containing the legislation about the use of safety restraint for children in vehicles and warning of possible penalty (GI1), educational intervention for children, with delivery of posters and cards of reminder (GI2) versus control group without any intervention (only observation for comparison). **Location:** School	The use of safety seats in children of the GI2 (with educational activity) increased significantly (p=0.009), being that the other groups did not obtain progress (GC p=0.93/GI1 p=0.62).
Minchom et al./ (1984)/ United States/ Medline	To observe the effect of a brief health education program (accidents) targeted to parents and children from a community of Cardiff.	**Method:** Cross-sectional study, descriptive. **Resource used:** Informative materials, lectures, orientations by speakers. **Local:** Community	There was no significant change after the educational campaign carried out for one month in the number of accidents (6 to 9%).
Educational interventions with preschool children			
Araújo et al./ (2017)/ Brazil/ BDENF	To promote educational activities for the prevention of accidents with preschool children and to verify the parents´ and teachers´ knowledge about the accidents prevention.	**Method:** Cross – sectional study, descriptive. **Resource used:** Illustrative images about falls, burns, drownings and traffic accidents. **Location:** School	The children had greater knowledge about the burns and little knowledge related to the traffic accident.
Bovis, Harden, Hotz/ (2016)/ United States/ CINAHL	To assess the effectiveness of the newly-developed WalkSafe Pre-Kindergarten (Pre-K) Safety Walkers Curriculum to	**Method:** Controlled clinical trial. **Resource used:** Educational intervention (DVD and demonstrations).	The scoring of knowledge in the post-test (M=6.64) was higher in relation to the pre-test (M=5.48) after receiving the WalkSafe pre-K (curriculum).

Author / Year / Country / Databases	Objectives	Method / Resource used / Location of the study	Main results
	educate preschool children in basic concepts of safety for reinforcing in all the primary school.	**Location:** School	
Borzekowski et al./ (2014)/ United States/ Scopus	To examine the effects of the guidelines of the messages and of the parental mediation about the children´s perceptions about the safety messages against fires conveyed by animated cartoon.	**Method:** Randomized clinical trial. **Resource used:** Educational intervention with animated cartoon (burn and fume inhalation). **Location:** Community	The understanding of the message was poor (50% of the children chose the appropriate behavior). Only the group of parental mediation (with script) had significant association (burn–coefficient=0.37 and smoking-coefficient=0.55) (P<0.001).
Lehna Carlee et al. (2013)/ United States/ CINAHL	To assess a standardized interactive of safety program referring to the risk of fire at home for students from the primary and fundamental school.	**Method:** Controlled clinical trial. **Resource used:** Educational intervention with techniques of prevention of burns and orientations of firefighters. **Location:** School	There was no statistical difference in the scoring of the tests for children from the kindergarten before and after the intervention (p=0.833). This result was justified with the cognitive development of these children. The intervention was effective in children from the classes 1-2 (5 to 13 years old) (p=0.001).
Renauld, Suíssa/ (1989)/ Canada/ Scopus, Cochrane Library	To determine the effect of the certain elements of simulation games, role-playing, group dynamic, modeling of behavior, formation of attitudes, behaviors, and transparency of learning in five years old walkers about the rules of safety in the traffic.	**Method:** Randomized clinical trial. **Resource used:** Simulation games: focus on the attitude (GI1); focus on the behavior (GI2); and alternation of both the above (GI3) versus GC without interventions. **Locations:** Schools	The GI3 that combined simulation with role-playing, group dynamic and modeling of behavior obtained the highest means compared with other groups. All the intervention groups reached higher means than the control group, non-statistically significant. The simulation games are effective educational strategies to trigger interest in modifying the attitude and behavior about the rules of safety in the traffic.
Krenzelok, Garber/ (1981)/ United States/ Scopus	To describe the application and evaluation of the program of prevention of poison.	**Method:** Randomized clinical trial. **Resource used:** Videocassette (10 presentations). **Location:** Schools	The educational intervention improved in 100% the understanding of children from 30 to 60 months.

DISCUSSION

The interventions developed on a more frequent basis for the purpose of education in health for preventing accidents were educational programs[19-21,31-32,35-36], use of printed informative materials (leaflets, posters, cards)[25,27,33,36-37] and of games or videos/DVD[22-23,26,28-30,34]. However, not all the studies have evidenced positive results[26,33,36]. These educational interventions [19-37] were analyzed as for the construction of knowledge of caregivers and preschool children supported on the pedagogical approaches, which can be mediated by educational technologies for the effective improvement of learning [38].

The actors of the social network of child constitute the target public of the educational interventions promoted by health professionals, due to often these grievances happening/during moments of parental or responsible and relatives inattention associated or not with the preschool children´s risk behavior[39]. Educational interventions mediated by professionals such as lectures [21,24,35] and associated with the technologies use [19,25,27,32-33,36] are capable of improving the knowledge and skills of the caregivers in the accidents prevention. On the other hand, the use of educational technologies without involving the facilitator and/or in campaigns disseminated through the distribution of informative materials do not take into account the individual needs and the context of each family, what could impact in minor effect in caregivers´ and preschool children´s knowledge [26,36].

In the construction of new educational Technologies used in the pedagogical approaches, the content should be properly assessed, of easy undestanding, taking into account the social, demographic, economic and cultural contexts of the target public [40]. This relevance shows the better effect of the knowledge by using a multimedia DVD when compared to the use of the same tool with basic information [22]. As well as in the occurrence of positive or negative results, when one does not take into consideration, for example, the income and the schooling level of the population [32,41].

On the other hand, educational interventions with traditional pedagogical approach, based on the transfer of content, without considering the students´ participation in the knowledge production, although mediated by educational technology, might cause demotivation among the students [17]. Teaching is not only to transfer knowledges, as well as to create possibilities for its own production or construction [17], as shown in the promotion of an educational intervention about the traffic safety (posters and reminder cards) for the children, which increased significantly the learning when compared to a coercive intervention (warning letter of impeding penalty) alongside parents, who did not adhere to safety measures for the child in the car transport [27].

The educational approach focused on the student is more effective in the construction of knowledge and behavior changes of caregivers [21,25], and school children[37] about the accidents prevention. During educational activities target to children it is essential to awake its attention, through playful methodologies [42], for the change of behavior. This attitude encourages understanding of how to act to guarantee its safety in environments that offer risk for accidents such as in the car, mainly before the use of seat [27].

Preschool aged children in this phase of cognitive development, called pre-operational, characterized by symbolic thinking, may have an insignificant learning before the pedagogical approach and the technological resource in the educational intervention [18,26,27,36]. The use of active teaching methodologies permeated by the playful activities such as games, make-believe plays, toy use, drawings and paintings to preschool children become

effective measures to stimulate the preventive actions and, consequently, reduce the accidents in the childhood [28-29,37,43].

According to Piaget, during the pre-operational stage of the cognitive development in children two to 6/7 years of age, predominate the intuition, impression and perception through the symbolic thinking that can be developed in the drawings, make-believe plays and by way of imitation [44]. In this phase, the educational approach permeated by the playful allows the learning to be efficient and effective, because awakes, intentionally, the preschool children´s imagination about the understanding of its reality, leading it to the phenomenon called transcendence, in which meanings and knowledges about the unintentional accidents will originate [45]. For preschool teachers, it is essential to orientate and educate the children for the use of the playful resource in the accidents prevention [41,45], which becomes the learning process more dynamic, facilitating the understanding [29-30,37].

However, other activities used in the educational intervention non-traditional such as delivery of kits, explanation and observation of the practice, enabled the preschool children the appropriate knowledge of the use of the safety seat in the vehicle [27]. These results pointed out that, irrespective of the activity proposed, this shall be in line with the active teaching-learning methodologies as feasible strategies for the interventions of accidents prevention. The animated cartoons and educational videos implemented in the educational intervention, without the educator´s mediation, may be perceived by the child only as an entertainment, not having an impact on the learning process [26,28]. The challenge is the development of interactive animations, in which the child can manifest itself and that enable more safe changes of behavior and in line with the good health practices.

The educational game of simulation was the more adequate resource for the cognitive development phase in children five years of age, when combining *role-playing,* group dynamics and behavioral modelling to modify the attitude and behavior as for the safety rules in the traffic [29]. The educational interventions about the unintentional accidents were beneficial when used interactive game, simulation games and educational videos [29-30,34].

The preschool education professionals take on the responsibility for these children during the activities developed in the school environment. The choice about the type of pedagogical approach and educational technology for be used in the assessment of the knowledge of the preschool education are essential for the effectiveness of the results and planning of actions related to the prevention of accidents in the school environment. In teacher understanding, the actions of accidents prevention must be carried out by active surveillance (attention and immediate care) and changes in the physical environment (tables, chairs, floor, walls, bathrooms and furniture), provided in the everyday of the childcare to offer safety to the preschool children [41].

The predominance of the educational interventions for preventing accidents in the school environment [26-27,29-31,34-35,37] is due to that the preschool children spend part or all day of their everyday (morning or afternoon) in this environment, by favoring the applicability in this target public and their caregivers [46]. It is worth considering the consistency among the environment addressed (home, school, fleet, street, among others), the target public characteristics and the more adequate educational approach, in order to obtain favorable result in the implementation of educational interventions and promoting the health and, consequently, the reduction of the morbimortality associated with this grievance [5].

In this review, a gap of studies that involves in the same research formal caregivers, teachers and other professionals participant in the care to children in the preschool education. In this sense, new researches should be encouraged involving, not only caregivers in this specific group of children, but also the persons involved in the preschool education. The formal caregivers, due to the family configurations in that the mother is included in the labor market, are the responsible for the daily care of the children and must be capable of preventing domestic accidents – falls, burns, intoxication, chocking, trauma, among others.

The school, as the more used location for the educational interventions in this review can be considered as a promoter health environment that enables screening actions and forwarding to the health services, clinical or social diagnosis and the effectiveness of interdisciplinary and intersectoral action in offering trainings for the teachers from the primary health care [47]. The articulation of the Family Health Strategy (FHS) to PSE is essential to contribute to the integral formation to the children and adolescents through strategies of health promotion, prevention of diseases and grievances and confronting of vulnerabilities, accidents and/or violence that may compromise the children´s development [10].

The health education enables the knowledge construction, based on the participation and the dialogue, with the aim to value the knowledge of persons, and not only the scientific knowledge, based on the reflection and construction of the critical awareness and its own health and of the community [48]. In the interventions permeated by the health education, it produces the knowledge, which consists of knowing about certain event and in the ability to apply it for the problems resolution. This action is relevant due to encourage the individuals to assume attitudes, have way of proceeding, with opinions, predispositions, and, consequently, adopt practices in the application of rules and principles of a science or art in certain situation [49].

The nurse and other health professionals are responsible for developing actions of promotion to the children´s health at school and should be able to use the technologies in the teaching-learning process. The evolution of the communication means enabled the increase of new technologies, videos/DVD[22-23,26,28,30,34], computers[19,21] and smartphones, as educational tools. The association between the lectures and counseling with the informative materials, videos or computers facilitates the educational development for the preschool children, caregivers and preschool education professionals [40].

The concern in the development of educational interventions for the traffic safety of children as passengers (car seats) or walkers evidenced in the studies [21-23,26-27,29,34] is related to high rates of incidence of traffic accidents among children in the world [3]. However, the reduction of the mortality rate regarding this type of accident in Brazil declined from the 10th to the 11st position of the ranking of the countries in the period from 1990 to 2015, involving children under five years. This effect is arising from several preventive actions such as the improvement of the traffic signals in the routes, the obligatory use of the little chair from 2008, the control of the bodies responsible and the educational campaigns mediated by governmental and non-governmental organizations [50].

The proposal of public policies about the accidents prevention in the childhood articulated with the existing non-governmental organizations (*Safe Kids*, Safe Child) is essential, with the aim at planning and implementing intersectoral actions for the persons´ awareness involved in the care of children in different coexistence environments. All the studies [19-37] emphasized the importance of actions of primary prevention to minimize the risk factors, to offer safety in different spaces of children´s coexistence (home, school, community) and,

consequently, to reduce the incidence of unintentional accidents. The risk factors can be associated with age, sex and lack of perception of the risk of the child before seven years of age, to the knowledge, attitude and caregivers´ practice, to the physical structure and adequate materials in the environment as well as the inexistence of actions of prevention [39].

One of the limitations evidenced in this review was that it did not allow the extension of the assessment of the educational technologies´ effect for the general population due the fact of the most studies were clinical trials with specific target public. Another aspect to consider refers to the absence of records regarding the practice of these technologies in teaching institutions and/or governmental organs.

CONCLUSIONS

The educational interventions were predominantly targeted to the preschool children´s caregivers, becoming evident the need to promote more researches with educational interventions about prevention of accidents for the formal caregivers and preschool education professionals, present in the daily, and participating in the social preschool children network. Regarding the use of the educational technologies, the most used were the instructive programs, informative materials and videos/DVD. In the educational interventions applied to the caregivers, only the lecture or the same associated with the educational technology was the more effective teaching method.

Another aspect to consider is the pedagogical approach based on the active teaching methodologies that showed more effectiveness of the educational interventions. New researches should be carried out to verify the adequacy in the selection of active methodologies associated with the educational technologies, mainly in clinical trials, in order to prove the effectiveness of the educational interventions contextualized to target public. The most common location for carrying out the studies was the school, allowing the practice of intersectoral actions such as the PSE, to favor the exchange knowledge among the health professionals (nurses, physicians, odontologists) and of the education. The nurse, as one of the professionals from the primary health care, when working in the actions of health education could transform the school in a promoter health environment of the preschool children and, thus, reduce the risk factors and, consequently, the incidence of the accidents in the childhood.

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