CHAPTER-2

REVIEW OF LITERATURE

❖ PREVALENCE OF UNINTENTIONAL INJURIES AMONG CHILDREN.

❖ KNOWLEDGE AND SAFETY PRACTICES OF MOTHERS REGARDING UNINTENTIONAL INJURIES AMONG CHILDREN.

❖ IMPORTANCE AND EFFECTIVENESS OF INTERVENTION PROGRAMMES FOR INJURY PREVENTION.

❖ IMPORTANCE AND EFFECTIVENESS OF MULTIMEDIA IN INJURY PREVENTION.
A comprehensive review of literature is must in any research endeavor. It is a concise overview by the investigator of what has been studied, argued, and established about a topic, and it is usually organized chronologically or thematically. A literature review surveys scholarly article, books and other sources relevant to a particular issue, area of research, or theory, providing a description, summary, and critical evaluation of each work. The layout of the present study rests on the following cornerstones:


C). Importance and Effectiveness of Intervention Programmes for Injury Prevention.


A). PREVALENCE OF UNINTENTIONAL INJURIES AMONG CHILDREN

Childhood injury is a major public health problem throughout the world (Mathers, et al., 2008) and is becoming a cause of increasing concern, especially in the developing countries (Babu, et al., 2016). Unintentional injuries within the home environment have not so far been recognized (Bansal and Dalal, 2013) and urgent attention is needed to reduce child injuries and address risk factors according to local context (Kataoka, et al., 2015). Preschoolers carry the greatest injury burden among children aged 0–14 years and these commonly occur at home (Simpson and Nicholls, 2012) and encouraging the collection of data on injuries and establishing a database on childhood injuries are some of the steps to be taken in initiating a national injury prevention initiative (Mathew, 2000).

INTERNATIONAL STUDIES:

Georgia Child Fatality Review, (2015) in a report stated that in United States of America, the unintentional injuries among children of 1 to 19 years are
the leading cause of death, which almost represents about 40 percent of all the death in this age group. Each year, an estimated 8.7 million children and teens from birth to age 19 are treated in emergency departments for unintentional injuries and more than 9,000 die as a result of their injuries—one every hour. Fires or burns, falls, drowning, poisoning, suffocation, and transportation-related injuries are among the most common causes of unintentional injuries in childhood. Injuries claim the lives of 25 children every day. While tragic, many of these injuries are predictable and preventable.

Alonge and Hyder, (2014) stated that deaths from injuries in Western sub-Saharan Africa and South Asia accounted for more than 50% of all deaths. Rates in these regions are 68.0 and 36.4 per 100 000 population, respectively, compared to 6.4 in Western Europe. Road traffic injuries (RTI) are the commonest cause of death, followed by deaths from drowning, burns and falls.

Kamel, et al., (2014) carried out a study in Egypt, in Damares village, El-Minia, with objectives to measure the types and incidence of home injuries in rural areas affecting the children aged up to 12 years. This cross-sectional and a descriptive study included 283 mothers as sample and structured interview was conducted to elicit the response. The results revealed that at the previous 8 weeks, 39.8% of the children suffered from home injuries. About 30% of the injured children were aged ≤3 years and 48% stated cut/wound as the highest percentage of home injury, followed by this was fracture/fall representing 36% and burn were 11.9%.

Report on Strategic Plan for the Prevention of Unintentional Injury, (2013) unveiled that unintentional injuries are the second leading cause of death for Massachusetts children ages 1–14. In fiscal year 2011, Massachusetts infants and children ages 0 to 14 years required more than 117,000 emergency department visits and over 2,000 inpatient hospitalizations for treatment of non-fatal unintentional injuries. As a result of unintentional injuries, 18 Massachusetts children in 2010 died whose age was 1–14 years.
Banerji & Inuit and Métis Health Committee, (2012) reported that according to Statistics Canada, mechanisms of injury focus on the major causes of injury-associated morbidity and mortality. These are -

-Motor vehicle collisions: MVCs cause the most injuries and deaths in First Nations children and youth.

-Drowning: Drowning remains a common cause of death, especially for males. Although Indigenous peoples comprise about 5% of the Canadian population, they account for approximately 26% of drowning which involve a snowmobile, 16% of drowning after a fall, 10% of drowning during recreational aquatic activities, and 9% of drowning related to boating activities.

-Fires: In a survey, fire deaths were found to be about 31% in children of 1-14 year age in Indigenous populations, as compared it was found to be 16% in the general Canadian population.

Centers for Disease Control and Prevention, (2012) revealed that in United States between 2000–2009, unintentional injuries among children aged 1–19 years accounted for 42 percent of all Years of Potential Life Lost (YPLL). The YPLL rate due to unintentional injuries among children was 5 times higher than the rate for cancer, 13 times higher than the rate for heart disease, and 31 times higher than the rate for influenza and pneumonia. What is the Burden of Child Injury, by Cause of Injury?

-Motor Vehicle-related Injuries: Motor vehicle-related injuries are the leading cause of death for U.S. children aged 5–19 years. These injuries account for 24 percent of deaths from all causes in this age group and for most (63%) unintentional injury-related deaths. In addition, 514,604 children were treated in hospital EDs in 2009 for non fatal injuries from motor vehicle crashes.

-Suffocation: Unintentional suffocation is a leading cause of fatal and nonfatal injury among infants and young children. More than three-quarters of injury deaths among those younger than 1 year old are due to suffocation.
-Drowning: The location of drowning varies based on the age of the child. Infants tend to drown in bathtubs; children aged 1–4 years in swimming pools, and older children in natural bodies of water (e.g., lakes, ponds, and rivers).

-Poisonings: It was found that in U.S. 824 children in 2009, died and more over the greater ones i.e. 116,000 were treated due to poisoning in hospital emergency departments. For unintentional exposure to prescription and over-the-counter medications young children are especially at risk.

-Fire and burn injury: In 2009, almost 119,000 U.S. children were injured severely enough due to unintentional fires and burns that they had to visit an ED.

-Falls: Falls are the leading cause of child injury-related ED visits, accounting for more than 2.8 million emergency department visits in 2009 and about 150 child deaths per year. Most fall-related injuries occur at home.

**de Sousa Petersburgo, et al., (2010)** discovered that childhood injury accounts for a substantial burden of disease in Maputo, Mozambique between the ages of 5–9 years (34.9%). An observational, prospective convenience study was conducted in 2007. During the study period the data was collected from 335 children who were presented to three hospitals having age of 0–14 years in Maputo. The prevalence of trauma-related complaints was 12%, and between the ages of 5–9 years it was 34.9%. Falls were the most common mechanism of injury having 40.6%, followed by this was burns with 19.1% and road traffic injuries with 14.3%. The majority 61.8% of falls occurred in the home and 94.1% were unintentional. Burns were predominantly due to hot liquids having 82.8% and less frequently i.e. 17.2% due to fire. The majority of burns (62.5%) involved the patient alone. The majority of RTIs were pedestrians who were struck by vehicles (81.2%). Falls were the most commonly reported mechanism of injury occurring in 40.6% patients, with 68% of these were 5–14 year olds. Most falls (36.0%) were reported as ground level falls and (25.8%) involved a fall from height. Most falls (61.8%) occurred in the home environment, and the vast majority (94%) was classified as unintentional.

**Lasi, et al., (2010)** carried out a study which aimed at determining the
incidence, nature, and extent of childhood injuries in two suburban and rural communities of Pakistan. The findings of the study were based on cross-sectional survey of 2,292 children aged 1-8 years. Retrospectively the information was sought from the primary caregiver on the occurrence of injury during the past three months. The most common non-fatal injuries were falls (10.5), followed by burns and scalds (3.5 burn injuries per 100 person), and road traffic injuries (RTIs) (2 RTIs per 100 person). During the study period one drowning casualty was also stated. The data also revealed that 61% of the injuries took place inside the home.

**Borse and Hyder, (2009)** in the study to document injury literature, a bibliometric analysis was carried out on published literature on low- and middle-income countries. Using MeSH terms on PubMed a systematic search was done. Papers by publication date on road traffic injuries were reviewed by country/cluster for two periods i.e. from March 2001 to March 2004 and April 2004 to April 2007. The rate of articles published per million population was calculated. Finally, a comparison was made between disease burden in disability adjusted life years (DALYs) and quantum of papers published. Results revealed that PubMed had 8.26 million articles listed; of which, only 2 per cent were on unintentional injuries. 41 per cent papers on road traffic injuries were from US, 36 per cent from Europe (other than Eastern Europe). Two most populous countries, China and India contributed only 0.9 and 0.7 per cent papers on road traffic injuries, respectively. India and China had less than one article on road traffic injuries per 1,000 road traffic related deaths. Unintentional injuries overall represented 18 per cent of the burden in terms of DALYs and represented only 2 per cent of all published articles.

**Chowdhury, et al., (2009)** in a cross sectional survey in 12 randomly selected districts of Dhaka Metropolitan City used stratified, multistage, and also the cluster sampling design. Simple random sampling was used to distribute sampling unit children over one year old. During the study period 5577 cases of unintentional injuries were identified in children aged 17 years or less including 154 fatal cases. Common causes of injuries among these children were falls (n =
29.8%), burns (n = 1013; 18.2%); injury by sharp cutting object or cut injury (n = 743; 13.3%); road traffic injury (RTI) (n = 675; 12.1%); drowning/near drowning (n = 495; 8.9%); animal bite (n = 361; 6.5%), and electrocution (n = 277; 5.0%). The rate of fatal and nonfatal injury among children of under 18 years was 43.8 per 100 000 children years and 1542.2 per 100 000 children years, respectively. Children below 1 year old were less vulnerable to injuries where as 1–4 years old children were the most vulnerable group. Drowning was the leading killer of children over 1 year of age and falls were identified as the leading cause of injury morbidity. However, in the study falls, burn, cut injury and road traffic injury were found as the 4th, 5th, 7th, and 8th leading cause of burden of diseases in regard to morbidity.

Van Niekerk, et al., (2008) in an analysis of the Injury Mortality Surveillance System at National level in 2004 statistics showed that while the proportional representation of children among all injury-related death is only 7%, twice as many of all burn and pedestrian injuries are located among children (15% each). Globally, burns are a serious public health problem. It has been estimated that each year deaths from fire alone is 195000 and global data are not available for many deaths caused by electrical burns, scalds and other forms of burns. Among the 15 leading causes of death fire-related deaths is one among children and young adults of 5-29 years of age. Over 95% of fatal fire-related burns occur in low- and middle-income countries. South-East Asia alone accounts for just over one-half of the total number of fire-related deaths worldwide. Death is not only the major outcome; apart from this millions suffer from disfigurements and, result in frequent shame and rejection. Drowning is the 3rd leading cause of unintentional injury death worldwide, accounting for 7% of all injury related deaths. There are an estimated 388000 annual drowning deaths worldwide. Global estimates may significantly underestimate the actual public health problem related to drowning.

Fatmi, et al., (2007) concluded that in Pakistan, the health survey at National level estimated the annual incidence, patterns and severity of unintentional injuries among persons over five years of age. For this, over the
preceding one year, interviews of 18,315 persons in urban and rural areas over 5 years of age were conducted using a two stage stratified design technique. The overall annual incidences of unintentional injuries were found to be 45.9 per 1000 annually. It was revealed in the survey that annually the expected unintentional injuries that occurred in Pakistan were 6.16 million among persons over five years of age. The annual incidence of injuries due to falls were 22.2, poisoning 3.3 and burn was 1.5 per 1000 per year. The majority of injuries occurred at home 19.2 or on the roads 17.0. Road traffic/street, school and urban injuries were more likely to result in handicap.

RoSPA, (2007) discovered that every year in the UK more than 5,000 people die in accidents in the home and 2.7 million turn up at accident and emergency departments seeking treatment. But, because the accidents happen behind closed doors in isolated incidents they rarely attract public and media attention. Among the very few national voices RoSPA is one who speaks on this subject. The common unintentional injuries and their causes among children are:

(a) Falls: Falls are by far the most common causes of accidents in the home; they account for 44 per cent of all children’s accidents.

(b) Fires: Domestic fires pose one of the greatest risks to children and the frequent cause to house fire is playing with matches and lighters.

(c) Scalds and burns: Many of the children who go to accident and emergency with a burn or a scald are referred on for further hospital treatment and also the recovery is long, painful and many result in with permanent scare.

(d) Poisoning: Most poisoning accidents involve medicines, household products and cosmetics. More than 28,000 children receive treatment for poisoning, or suspected poisoning accidents every year.

NATIONAL STUDIES:

Babu, et al., (2016) to find out the leading cause of pediatric admissions in Trauma Surgery in New Delhi, India conducted a study. For the study inpatient data was searched retrospectively in Jai Prakash Narayan Apex Trauma Centre
Trauma Registry. All patients aged 18 years or less was included. Results revealed that 300 patients over a 33 month period were the part of the study. Overall the predominant cause was RTAs in 132 (43%) patients. On subgroup analysis of up to 12 years age group (n = 147), the most common cause was found to be RTAs again. However, falls showed an incremental upward trend (36.05% in up to 12 age group versus 27% overall), catching up with RTAs (44.89%). Overall, 12 patients expired in the cohort.

Kataoka, et al., (2015) examined the occurrence and risk factors of serious non-fatal injuries in children aged 7–9 years (n=1820) from Andhra Pradesh, India. Logistic regression models were used to explore potential risk factors for these injuries. Based on a 3-year recall period, 336 (18.5%) children reported serious non-fatal injuries. Of the most serious non-fatal injuries reported, falls (n=186, 55.4%) were the major cause of injuries, followed by road traffic injuries (50, 14.9%), and assaults/blows/hits (26, 7.7%). Twenty children (6.0%) did not fully recover from their injuries, and 14 (4.2%) had long-term health problems as a result of their injuries.

Debnath, et al., (2014) assessed the knowledge of mothers regarding domestic childhood injuries and safety measures adopted in a cross-sectional study among 230 rural mothers of west Tripura district during May to June 2012. A semi structured interview schedule which was pretested was used to collect the information and the sampling technique used was a systematic random sampling. Only 3.9% met minor domestic injuries. Out of which 6 (66.7%) of respondents’ children 3 were treated at home, remaining at hospital and all of them recovered. The reported incidence of domestic injury was low that might have been due to under reporting.

Shriyan, et al., (2014) conducted a cross-sectional study on the profile of unintentional injury among under five children in coastal Karnataka, India from October to November, 2014 attending the anganwadis in Udupi Taluk. Time frame located convenient sampling method was adopted and a total of 95 mothers of children under-five were interviewed by using interviewer administered semi-structured questionnaire. The results revealed that the prevalence of unintentional
injury among under-five children was 46.3% and the commonest causes of the injuries were due to falls followed by burns and animal bites. From the study it can be concluded that the prevalence of unintentional injuries among under-five children was high.

**Bansal and Dalal, (2013)** with the aim to determine the profile of unintentional injuries in Fanda block of district Bhopal, carried out a study. All the inhabitants (13,587) of randomly selected 11 villages of Fanda block formed the study population. 487 persons had a total of 543 new injuries during three months prior to the interview. Only 292/543 (53.7%) of the recorded injuries received medical care at health facilities. Home and road traffic injuries constituted the most common injuries with incidence rates of 27 and 24, respectively. Home injuries were most common among young children. Maximum injuries recognized were due to cutting and crushing. Falls were the leading cause among the young.

**Zaidi, et al., (2013)** to describe the patterns of injuries among children of rural and urban registered areas under department of community medicine, carried out a community based cross-sectional study at JNMC, Aligarh. A 282 household’s survey was conducted. A standard questionnaire was administered to guardians of 91 of these children to elicit information on the etiology of the injury, demographic and socioeconomic details. Study results revealed that children aged 6-15 years (19%) suffered more injury than children under 5years age group (14%). Under five year old children were found to be more prone to fall (32.4%) and struck/hit by person or object (32.4%) as compared to children aged 6-15 years. Injuries due to fire/flames or heat (8.8%) were found to be more in children in under 5 years age group as compared to other group.

**Children in India, (2012)** reported that while an absolute increase of 181 million in the country’s population has been recorded during the decade 2001-2011, there is a reduction of 5.05 millions in the population of children aged 0-6 years during this period. Death rates for children age 5-14 is generally a period of lower mortality than at ages 0-4 years. The main leading causes of death at ages 5-
Certain infectious and Parasitic Diseases (22.9%), Injury, Poisoning and Certain Other consequences of External causes (12.5%), Diseases of the Nervous System (11.5%), Diseases of the Circulatory System (10.5%), Diseases of the Respiratory System (8.5%), and Other Major groups (34.2%). In 2010, it was anticipated that, out of the total reported deaths, by the Sample Registration System, 14.5% were infants below 1 year, 3.9% were deaths of 1-4 year children while 18.4% were deaths reported of children of 0-4 years and simultaneously the 2.7% deaths were of children in the age group 5-14 years respectively.

Ray, et al., (2012) carried out a cross sectional epidemiological study to find the profile of injuries among municipal primary school children in Siliguri, from February - May 2009 in, West Bengal. 20% of total primary schools under Municipal Corporation of Siliguri were randomly selected. To assess the profile of injury and associated factors a pre-designed as well as a, pre-tested schedule was used. Total number of children participated in this study were 956 out of total 1165. The age of children was between 5-12 years and the response rate was 82%. 7.18 ± 1.48 years was the mean age of all the children. Among all the injuries, open wound was the commonest type of injury which accounted for 59.6%. The most common site to be injured was the extremities (55.3%). It was found that injuries experienced was more than 41% at home, followed by this was 31.6% which was on road. When considering the causes of injury, fall was found at the top level with the percentage of 39.5 for most of the cases, followed by this was collision; both of these occurred mostly during sports and other playing activities. 44.5% of the injuries were managed by the first-aid care. The commonest place of first-aid was either at home or at traditional practitioners 36.9% and 7.6% were managed in the school. The medical practitioners as well as the hospitals managed for 55.5% of the cases.

Bhargava, et al., (2011) carried out a study on 200 consecutive children aged 12 or less reporting to the Neurosurgical emergency unit. Amongst the 200 patients aged 12 years or less; 105 children were in the age group of 1–5 years and 82 children between 5 and 12 years. The most common mode of injury was fall from height (unprotected rooftops while playing) seen in 56.5% of patients,
followed by road traffic accident (being hit by a moving vehicle), accounting for 21% of injuries. Other modes were simple falls from chair or bed (17.5 %) and falling of heavy objects on the head. Slight carefulness on the part of parents can help avoid disastrous consequences for the children.

Sharma, et al., (2011) conducted a prospective study at a tertiary care hospital over a 12-month period. Out of the total 6102 pediatric patients admitted, the cause of admission for 791 patients was trauma. The mean age of presentation was 6.3 years. School-going children (6-12years) were the most commonly injured (52.33%). Fall from height (39.44%), RTAs (27.83%) and burns (15.18%) were the most common mode of injury leading to pediatric trauma. Most of the cases (98.36%) were injured unintentionally. RTA was the second most common mode of injury. Of 220 children involved in RTA, 64.54% were pedestrians, 20.45% were two-wheeler passengers and 15% were four-wheeler passengers. Preschool age group formed the largest group of poisoning victims (71.73%). Most of these victims had ingested kerosene (67.39%) followed by insecticide (13%), castor seed (10.86%) and drugs (8.69%). The study also revealed RTA as one of the major causes of injury, causing the highest mortality (35.29%), followed by burns (27.45%) and fall from height (15.68%). The prevalence of trauma in childhood patients was approximately 19.23%. This was probably due to delayed presentation to our tertiary institute, or probably due to lack of knowledge. Home was the most common place of injury. By study findings it can be concluded that majority of pediatric injuries are preventable and pediatric epidemiological trends differ from those in adults.

Verma, et al., (2009) conducted a prospective study from March 2006-February 2007, at the emergency services of a tertiary care hospital with approximately 3,000 pediatric injury visits annually. Two hundred and twenty five children with a mean age of 6.14 years (range 2 months to 12 years) were enrolled. School children (6-12 years) were most commonly injured 50.6%, followed by preschoolers [(3-5 years) 26.6%], toddlers [(1-2 years) 18.6%] and infants [(0-1 years) 4%], respectively. Home was the most common place of injury [137 (60.8%)]. Other sites included street/highways [38 (16.8%)],
Park/playground [37 (16.4%)], school [8 (3.5%)] and miscellaneous (workplace, neighborhood etc.)[5 (2.2%)].

Swami, et al., (2006) carried out a descriptive hospital based study to find out the common types of unintentional injuries among children admitted for management of unintentional injuries in Pediatric Surgery department and Intensive Care Unit of a tertiary care hospital of North Kerala and to find out the contributing risk factors. A total of 400 children admitted during the study period of 6 months of 2009 constituted the study population. Mechanical injuries comprising of Road traffic accidents and accidental fall were the major cause of unintentional injuries (36%), followed by Poisoning (22.3%). The study highlights the need to identify the different types of unintentional injuries and the risk factors of childhood injuries which require hospitalization. Identification of risk factors will help to formulate strategies aimed at risk reduction and prevention of childhood injuries.

Overall from the above studies it can be summarized that unintentional injuries has been very common and prevalent as revealed in studies since 1986 by Mohan, which make known that in South-East Asia injuries, account for not only 1.4 million deaths and along with this probably 54 million disability-adjusted life-years (DALYs), Deal, et al., (2000) stated in their study that Injuries can be fatal or nonfatal, and they can occur unintentionally. Mathew, (2000) revealed that more than 90% pediatricians reported that they attend to children with injuries and Tiagi, et al., (2000) uncovered in their study that injuries are a worldwide health problem in terms of high morbidity and mortality and maximum took place at home. But still, has been till today an increasing cause of concern only, especially in the developing countries (Babu, et al., 2016).

B). KNOWLEDGE AND SAFETY PRACTICES OF MOTHERS REGARDING UNINTENTIONAL INJURIES AMONG CHILDREN

The literature about mothers' knowledge regarding unintentional injuries from different part of world like England, Qalubeya governorate and El-Minia from
Egypt, Baghdad, Assiut Governorate, Tehran (Iran), Ghana, Nigeria, China, Singapore, Nepal, and Tripura, Kanyakumari, Chennai etc from India has been mentioned and along with this the safety practices has also been discovered.

INTERNATIONAL STUDIES:

Ablewhite, et al., (2015) with the aim to identify the key facilitators and the barriers for parents in keeping children safe from unintentional injury within their home conducted a study with 64 parents having child less than five years of age and for this purpose a semi-structured interviews were conducted in the home. This qualitative study was Multi-centered which was conducted in four centers (Nottingham, Bristol, Norwich and Newcastle) in England. The results revealed that the facilitators for injury prevention were parental supervision and teaching the children about injury risks. The barriers to injury prevention included parents perception that some injuries were an inevitable part of child development, parents’ not anticipating injury risks nor the consequences of some risk taking behaviors, also a interrupted supervision due to distractions, maternal fatigue and the presence of older siblings, difficulties in adapting homes, unreliability and cost of safety equipment and provision of safety information later than needed in relation to child age and development. These included parents’ allowing their children to learn about injury risks through risk taking in a controlled manner, using safety rules and ensuring through supervising children that safety rules were adhered to. The home can be adapted by installation of safety equipment or the key facilitators are removing hazards from the home. It was felt by some parents that they will be able to anticipate the injury risks by learning through other parents’ experiences regarding the injury events.

Kamel, et al., (2014) carried out a cross-sectional study with the objectives to assess mother's knowledge, attitudes and practices about the first aid of the children aged up to 12 years. This descriptive study had a sample of 283 mothers residing in Damares village from El-Minia in Egypt. The study results revealed that 22.3% of mothers were unknown to the term first aid. The main source of knowledge of the 38.5% mothers’ was television. The home injuries practices of respondents towards the children increased with increased educational
level. Better practices in case of home injuries were found in the older mothers. It can be concluded that the significant predictors of knowledge, attitudes and practices score among the studied mothers were found to be the mother’s level of education, older age, source of knowledge about first aid, and occupation.

Lafta, et al., (2014) conducted the cross-sectional study with the objective to assess the level of knowledge of women with respect to children's domestic accidents. Through a stratified random sampling technique, 20 PHCCs was taken by dividing Baghdad City into its two main parts Karkh and Russafa. A well-structured questionnaire was developed that constituted questions on four main types of accidents involving children (poisoning by chemicals and detergents, electric shock, injuries from sharp instruments in the kitchen, and burns). The total number of women enrolled in this study was 1032. The results revealed that only 9.2% of the mothers acquired a good level of knowledge in prevention of injuries from chemicals and detergents, and more than 90% were found to have poor knowledge. The same was found regarding knowledge about preventing electrical accidents caused by power sockets and electrical appliances where only 10.2% of the mothers were found to have a good level of knowledge. The results were not much better regarding accidents caused by fire, only 11.6% of the mothers scored well.

Shrestha, et al., (2014) carried out a study to assess the knowledge of mothers regarding prevention of minor accidents among children at Taddah, Nepal. The sample size was 100 mothers attending MCH clinic and having at least one toddler. The devices used for the collection of data were knowledge questionnaire on minor accident prevention. Data collection technique was through interview. The study reveals that the 73% people had average knowledge, 26% people had good knowledge and 1% people had poor knowledge regarding accident prevention of children under five.

Arulogun, et al., (2013) conducted a study in Ibadan Southwest Local Government Area of Nigeria, to assess the knowledge and practices of 756 mothers having pre-school children for domestic accident. For data collection a pretested questionnaire having a 15-point knowledge scale related to domestic
accident prevention was used. 46.0% of the respondents, reported domestic accidents in their preschool children like falls (47.0%), 23.5% reported for burns and 8.4% for ingestion of kerosene in children. 85.3% of the respondents perceived that domestic accidents were not totally preventable and 50.8% as part of children’s development. Preventive practices employed included 58.5% for consistent monitoring, 55.5% of them revealed keeping drugs in secured boxes. Main influences for adoption of the preventive behaviour included were the self responsibility by 58.1%, perceived danger by 37.0% and fear of husband’s reaction by 32.7%. Descriptive statistics and ANOVA were used for data analysis. The preventive practices need to be strengthened but the knowledge among the respondents on the causes and prevention of domestic accidents was high.

Hatamabadi, et al., (2013) carried out research with the aim to evaluate factors influencing the knowledge and attitudes of 230 mothers regarding their adoption of preventive measures for home injuries. This descriptive/analytical study consisted of all mothers of preschool children with home injuries, who had referred to the emergency department of two hospitals in Tehran, Iran. Multivariate logistic regression analysis and chi-squared test were used. Finally of 230 mothers evaluated, 75.0% had good knowledge and 46.2% had positive attitudes.

Siaw, (2013) employed the cross-sectional descriptive design to explore the preventive practices among parents/caretakers of the children of municipality of New Juaben of Ghana for determining the effectiveness of practices for the sake of providing interventions to reduce the occurrence of injuries. The quantitative and qualitative methods of data collection were used. Simple random sampling was used to select 600 parents/caretakers from 12 out of the 52 communities in the New Juaben Municipality. It was found that covariates such as not leaving children alone at home (OR 3.216, 95% CI 1.813 to 5.704), keeping matches / lighter out of reach of children (OR 2.806, 95% CI .039 to .160), preventing children from playing at the kitchen (OR 1.806, 95% CI 1.060 to 4.981) and educating children not to play with fire/lighter/matches (OR
1.278, 95% CI .0970 to 3.052) were found to be significant in preventing childhood burns while educating mothers on fire safety practices at home (OR .864, 95% CI .380 to 1.964) was not significant in preventing childhood burns.

**Eldosoky, (2012)** stated that the increasing concern of the community health is the injuries that are arising from home accidents among the children. With the purpose to assess mothers' knowledge, attitudes and practices (KAP) having children aged up to 12 years in Qalubeya governorate, Egypt regarding first aid and its associated factors Eldosoky carried out a cross-sectional study. A sample of 1450 rural mothers was taken and the response was elicited through an interview questionnaire. The mothers answered an average of 11.0 (SD 5.3) out of 29 KAP questions correctly regarding the incidences of home injuries like cut wounds, falls and fractures, burns, poisoning and foreign body aspiration held in the previous 4 weeks.

**Wang, et al., (2012)** in Jinan, China conducted an investigation on the knowledge, attitude and practice about injury and the associated factors among school children's parents. The purpose was to make available the scientific data for the development of Safe School. A self-administered questionnaire was provided for investigating 3617 samples. It incorporated 40 questions which were related to the knowledge, attitude and practices regarding the injury prevention and safety promotion. The results revealed that the scores for knowledge, attitude and practices ranged from 13 to 39, with an average of 30.79 ± 3.54. So, the study results conclude that the knowledge, attitude and practices regarding the injury prevention and safety promotion were unsatisfactory.

**NATIONAL STUDIES:**

**Hema and Dilli Babu, (2015)** to assess the level of knowledge regarding first aid management of domestic accidents among mothers of under five children and safety practices at home in rural village, Chennai conducted a research study. Descriptive research design and non probability convenience sampling technique was used. Structured interview and observation technique was used to collect the data from a sample of 100 mothers. Findings of the study revealed 27% of
mothers reported that their under five children had history of domestic accidents. Among mothers, 56% of them had inadequate knowledge regarding first aid management. 98% of the houses were found unsafe. There was significant association between mothers age, education, occupation, socio economic status, type of family and knowledge regarding first aid management (P<0.05). The study findings concluded that the knowledge of mothers regarding first aid management was inadequate.

Suguna, (2015) conducted a study in Tamil Nadu on Women’s of awareness about domestic accidents among toddlers in Kanyakumari. The sample size was 300 mothers. The data on the nature and types of domestic accidents revealed that 20% of the population had inadequate knowledge, 25.3% had average knowledge, and the remaining 54.7% had adequate knowledge. When the information relevant to the knowledge of mothers regarding the first aid done for the domestic accidents was revealed it found that 19.7% mothers had inadequate knowledge followed by 31.6% having adequate knowledge and the remaining 48.7% having average knowledge. Simultaneously on prevention of accidents revealed 43.3%, 41% and 15.7% with average, adequate and inadequate knowledge respectively. Therefore the study recommended that a well planned health educational program is needed about the causes of domestic accidents.

Debnath, et al., (2014) in a cross-sectional study to find the knowledge of mothers regarding domestic childhood injuries and safety measures adopted by among 230 rural mothers of west Tripura from May to June 2012 selected the individual participant using systematic random sampling technique. The information was collected by using semi-structured interview schedule which was pretested. The study results revealed that 3.9% of the mothers had inadequate knowledge while the remaining 96.1% had moderate knowledge level. As far as the practices were concerned 98.3% of the respondents were having moderate level of practice followed with 1.3% with high level of practice, and remaining 0.4% with inadequate level of practice. It was found that there was no significant
association between the level of knowledge and practices regarding home safety measures.

Aranha, et al., (2013) adopted a non-experimental descriptive survey design to assess the knowledge of mothers regarding safety needs of children with a view to develop an information booklet. 100 mothers having children aged 0 to 6 years were selected by using non probability purposive sampling technique. The data was collected using a structured knowledge questionnaire on safety needs of children from selected rural community area. The study revealed that 9% of mothers had average knowledge and 91% had poor knowledge on safety needs of children. The mean percentage of knowledge on safety needs of children was 31% with a standard deviation of 3.18. Based on the study findings the information booklet was developed and handed over to the samples.

Sonavane and Bhondawe, (2013) used a descriptive evaluatory research approach to find the effectiveness of self instructional module (SIM) on knowledge of 40 parents regarding prevention of domestic accidents among the under five children in the selected urban areas using the pre-experimental one group pre-test post-test design and 30 item questionnaires. In pre test most 38(95%) sample had average knowledge followed by 2(5%) with poor knowledge. Nil samples were there in good and excellent range.

Overall, the above studies expose to the fact that since beginning i.e. from 2005 by El-Aty, who concluded in a study in Assiut Governorate that about three-quarters of mothers had incomplete knowledge regarding home accidents among their children and the mothers’ practice toward home accidents among children under six years was deficient and Thein, et al., (2005) reported in a study in Singapore that 79 percentage parents have average knowledge and 21 percentage parents have poor knowledge regarding childhood injuries and its prevention till today, the mothers knowledge level range around average category with a slight inclination towards poorer category and the safety practices also range towards medium/average adoption category. Consequently, there is still an insistent requirement to reinforce both the knowledge and the safety measures to prevent unintentional injuries among children.
(C). IMPORTANCE AND EFFECTIVENESS OF INTERVENTION PROGRAMMES FOR INJURY PREVENTION:

The word intervention refers collectively to policies, programmes, strategies and all other types of activity in child injury prevention e.g. they can be ideally addressed from multiple avenues, including educational trainings/programmes, environmental changes, legislation, parent counseling, home-visits, community-based approach, supervision, engineering, providing safety equipment etc. Johns Hopkins International Injury Research Unit (JH-IIRU), along with World Health Organization (WHO), published a study that estimates between 8,000 and 80,000 lives could potentially be saved each year if certain injury prevention interventions are implemented and in parallel to it the research unit also revealed that according to a publication by International Journal of Child and Adolescent Health, the implementation of effective interventions could help in saving 1000 children a day (Johns Hopkins-International Injury Research Unit, 2013).

INTERNATIONAL STUDIES:

Banfai, et al., (2015) uncovered that accidents are among the most common causes of death in childhood. A study was conducted by Banfai and others to examine the first aid and accident prevention knowledge and attitudes of 307 parents of 3–7 years old children in six kindergartens located in Hungary was conducted. A self-fill-in questionnaire applying standardized items was used to collect data. Results revealed that the previously accomplished first aid training (p < 0.05) and the educational attainment (p = 0.029) had a positive impact regarding the correct answers. So, from the study results it can be concluded that a better accident prevention and first aid practice among parents can be contributed by the participation in a first aid course.

Sahril, et al., (2014) in a study assessed the prevalence rate and risk factors of home injury among children less than seven years old in Malaysia and concluded that a major focus in future research need to be directed on developing injury prevention programs targeting parental supervisory practices. In order to prevent injuries during childhood, full range of approaches such as education,
environmental modification and improving regulation and legislation need to be implemented. Henceforth, child injury prevention should be a responsibility shared by multiple components; government and non-governmental organizations, international agencies, academic institutions and also the business sectors.

**Arulogun, et al., (2013)** assessed the knowledge and practices for domestic accident among 756 mothers of pre-school children in Ibadan Southwest Local Government Area, Nigeria in a study. Educational interventions such as training and public enlightenment aimed at empowering mothers and significant others to be more involved in the prevention of domestic accidents among their pre-school children are recommended.

**Brussoni, et al., (2013)** examined in a qualitative study with 18 Canadian heterosexual couples parenting children 2 to 7 years old, dyadic decision making and negotiations related to child safety and risk engagement in recreational activities. Findings suggest that contemporary involved fathering practices privilege men in the outdoors and can erode women's control for protecting children from unintentional injury. We recommend promoting involved fathering that empowers both parents and developing injury-prevention strategies incorporating both fathers' and mothers' perspectives.

**Kendrick, et al., (2013)** carried out a study to assess the effects of parenting interventions for preventing unintentional injury as well as increasing possession and use of safety equipment and parental safety practices. The administration of the Randomised controlled trials (RCTs) were included and along with this, controlled before and after studies (CBAs), and non-randomised controlled trials (non-RCTs) were also included. All these evaluated parenting interventions to parents of children aged 18 years and under, and reported outcome data on injuries (unintentional or unspecified intent), and possession and use of safety equipment or safety practices were included. Fifteen studies were included in the review: 11 RCTs, one non-RCT, one study contained both randomised and non-randomised arms and two CBAs. Two provided solely educational interventions. Thirteen provided interventions comprising parenting education and other support services; 11 of which were home visiting
programmes and two of which were paediatric practice-based interventions. Thirteen studies recruited families at risk of adverse child health outcomes. Nine RCTs were included in the primary meta-analysis, which indicated that intervention families had a significantly lower risk of injury. Several studies found fewer home hazards, a home environment more conducive to child safety, or a greater number of safety practices in intervention families. From the study it was concluded that in reducing child injury most commonly provided parenting interventions, within the home that use multi-faceted interventions may be effective. The evidence relates mainly to interventions provided to families at risk of adverse child health outcomes. Further research is required to explore mechanisms by which these interventions reduce injury.

**Leung, et al., (2013)** carried out the pilot evaluation for disadvantaged Chinese parents having preschool children for the Healthy Start Home Visit Program was which was delivered by trained parent assistants. To make services more accessible home visiting was used for the disadvantaged families. The participants included 21 parent–child dyads. Paired samples t-test results indicated significant decreases in child home injury, and hospital visits. From the study the conclusion drawn was that there was promising evidence that the Healthy Start Home Visit Program was effective in addressing the needs of disadvantaged families with preschool children.

**Mytton, et al., (2013)** exposed that parenting programmes designed to support parents, promote behaviour change and enhance parent–child relationships have been shown to improve health outcomes in children. It is not known whether group-based parenting programmes have the potential to prevent unintentional injuries in preschool children.

**Olutayo, (2013)** in a study on mother's education, age and knowledge about home accident prevention among preschool children in Ilesa Metropolitan city: a relational approach examined the effect of mother education on prevention of home accident among preschool children. The study recommends that high premium should be placed on educational programme on home accidents and how it could be managed if it occurs, especially for mothers who have preschool
children. This may be part of both Pre and Post-natal training programme in hospitals.

**Siaw, (2013)** employed the cross-sectional descriptive design to explore the preventive practices among parents/caretakers of the children of municipality of New Juaben of Ghana for determining the effectiveness of practices for the sake of providing interventions to reduce the occurrence of injuries. The quantitative and qualitative method of data collection was used. Simple random sampling was used to select 600 parents/caretakers from 12 out of the 52 communities in the New Juaben Municipality. The study results concluded that there is a need for all stakeholders in child protection and welfare to collaborate in designing home-specific safety education campaign targeting the various age groups of children and parents with different socio–demographic backgrounds.

**Theurer and Bhavsar, (2013)** reported that parental safety behavior appears to improve by direct counseling by the physicians though it is uncertain that it would effect on reducing childhood injuries. In high-risk populations the community-based interventions can be effective.

**Zaidi, et al., (2013)** stated that in spite of the size of the burden of childhood injuries and the known potential for prevention, the need of international attention to injuries in terms of both policies and resource investments in public health is lacking. Successful prevention strategies often include multifaceted approaches such as education, incentives for safe human behavior, legislation/enforcement, and environmental changes.

**Banerji & Inuit and Metis Health Committee, (2012)** discloses that the research, knowledge dissemination, capacity-building, injury surveillance, as well as injury prevention programs which focus on local populations are urgently needed. Effective injury prevention would involve multidisciplinary, collaborative and sustainable approaches based on best practices while being culturally and linguistically specific and sensitive. At each stage in planning, implementation and evaluation of Indigenous programs communities should be involved. Demonstrating respect for local autonomy by obtaining consent before an
intervention or evaluation, and by ensuring that appropriate data-sharing mechanisms are in place, are essential for program success. Well-designed injury prevention strategies for American Indians have been effective in reducing hospitalizations, injury severity, and mortality rates, in addition to being cost-effective. To reduce the rate and severity of unintentional injuries improving education through public debates, conferences, and meetings of coalitions, specialists, community members and leaders were the recommendations made by the Canadian Pediatric Society. Also, strengthening advocacy, focusing surveillance, evaluating initiatives and reducing the barriers.

Centers for Disease Control and Prevention, (2012) make known that injury prevention includes strategies on many levels, such as preventing the injury event in the first place (e.g., avoiding drinking and driving, removing hazards in the home), preventing or minimizing injury after an event has occurred (e.g., child safety seat in a crash, smoke alarms in a fire, soft playground surfaces in a fall, bike helmets when cycling), and reducing long-term consequences of injury (e.g., emergency medical services, trauma care, rehabilitation). Another approach to injury prevention is a focus on the “Three Es”: Education, Enforcement, and Engineering. The most effective injury prevention efforts use a combination of these strategies:

1. The foundation of public health is Education For this venues can be developed for delivering child injury education programs in schools and communities and among new professionals. Training modules can be developed on child injury program implementation, evaluation, risk communication, and advocacy. Also the technology such as the internet can be used to improve access to child injury prevention training.

2. Enforcement uses the legal system to influence behavior and the environment and can be very effective in preventing injuries, especially when combined with education.

3. Engineering uses environmental and product design strategies.
The New Mexico Injury Prevention Strategic Plan: (2008-2012) disclosed that to effectively reduce death and disability due to injury, take a broader prevention approach. We examine factors such as the products people use, the economic and social circumstances under which people live, their physical surroundings, and the organizational and governmental policies that affect the safety of their environments. Often a confluence of factors such as income level, generational status, environmental conditions, geographic location, unique histories with health systems and government policies, occupational conditions, language barriers, discrimination, and inadequate access to treatment and medical services that characterizes the lives of these populations and contributes to the types and extent of injury disparities. So, the mission statement was- To prevent injury in New Mexico through community collaboration, capacity building, and action and the goal was - To increase public awareness about injury prevention in New Mexico through:

- Objective 1: Increase the number of programs/activities that address the public's understanding that injuries are a major public health problem, by 2012.

- Objective 2: Increase the number of programs/activities that address the public’s understanding that injuries are preventable, by 2012.

- Objective 3: Increase the number of programs/activities that address public beliefs that injury prevention requires both a personal and shared/community responsibility, by 2012.

Wang, et al., (2012) carried out an investigation in Jinan, on knowledge, attitude and practice about injury and the related factors among school children's parents was done in China so that for the development of Safe School scientific data can be provided in Mainland. A total of 3617 subjects were investigated with the help of a self-administered questionnaire. The results showed that health education on knowledge, attitude and practice about injury prevention and safety promotion for parents, especially among fathers and parents with low education levels, should be strengthened further by Safe School programmes.
Brussoni and Olsen, (2011) conducted interviews with a diverse sample of 32 fathers of children aged 2 to 7 years in British Columbia in which the questions addressed fathers' roles and typical activities with their children, child safety concerns and practices. Results revealed that injury prevention interventions can benefit from understanding the meanings and priorities fathers hold about their children's safety, creating programs that resonate with fathers to increase relevance. To maximize success, messaging should consider fathers' decision-making characteristics, incorporate the importance of healthy risk taking for child development, and teach fathers how to minimize likelihood of injury in the context of being active and taking risks with their child.

Pearson, et al., (2011) states that in children under the age of five, the majority of unintentional injuries occur in the home. This paper presents the findings of a systematic review about the effectiveness of programmes in decreasing unintentional injury rates to children (aged up to 15 years) in the home. The effectiveness with or without installation of the home safety equipment, preventive education or a home risk appraisal is presented by outcome: installation of smoke alarms, installation of other home safety equipments and injury rates. Analysis of the statistically significant evidence suggests that few programmes reduce injury rates in children except where home safety equipment is supplied in conjunction with a home risk assessment, although this effect was only evident in households where a child had previously suffered an unintentional injury. It was found that the programmes which were having an education component showed added success in comparison to the supplying the smoke alarms alone.

Laflamme, et al., (2010) stated that a 20 years of research on socioeconomic inequality and children's—unintentional injuries understanding the cause-specific evidence at hand was carried out. The study reveals that although numerous interventions have been evaluated and promoted as effective, few have been conducted that assess whether those interventions are equally effective in all socioeconomic groups (or areas) or if they help reduce differences between those
groups. In other words, very few interventions have been evaluated for their potential in childhood injury inequality reduction.

Lasi, et al., (2010) uncovered that there is a need to develop community-based interventions, creating awareness about the consequences of childhood injuries and educating families about preventive measures to reduce the incidence of injuries during early and middle childhood.

Smithson, et al., (2010) in a bibliographic study, the reviews considered barriers to, and facilitators of, success for interventions to reduce unintentional injury to children in the home through supply and/or installation of home safety equipment, and looks at risk assessments. For studies, the bibliographic records were investigated on interventions to trim down the unintentional child injuries in home, or on related attitudes and the behaviors. Studies were quality appraised, findings extracted, and a conceptual framework was developed to assess factors affecting the success of interventions. Nine peer-reviewed journal articles were included. Barriers and facilitators were highlighted at organizational, environmental and personal levels. Effective provision of safety equipment involves ongoing support with installation and maintenance. Take up and success of interventions depends on adjusting interventions according to practical limitations and parents' cultural expectations. A particular barrier was parents' inability to modify rented or shared accommodation. The review highlights ways in which health inequalities affect the take up and success of home safety interventions.

Ward, et al., (2010) exposed to that many areas of the home, road and play and leisure environments have hazards which increase the risk of injury. Supervision, safety equipment and education are important to help keep children and young people safe. Equipment has to be maintained to be effective.

Haas, (2007) revealed that community interventions can positively influence individuals’ behavior(s) while they facilitate positive and health-enhancing changes to people’s living environments. They can also have a long-
term and sustainable influence on societal norms that are relevant to safety and related behaviors.

**Kendrick, et al., (2007)** carried out a study to evaluate the effectiveness of home safety education, with or without the provision of low cost, discounted or free equipment, in reducing child injury rates or increasing home safety practices and whether the effect varied by social group. The results revealed that ninety-eight studies, involving 2,605,044 people, are included in this review. It was found that when the interventional programs are provided in the home the rate of injuries were reduced. Interventions providing free, low cost or discounted safety equipment appeared to be more effective in improving some safety practices than those interventions not doing so.

**RoSPA, (2007)** stated that the safety advice given directly to families and older people in their own homes reduces accidental injury. Communication plays an important role in the success of a home safety check.

**Traveras, et al., (2006)** affirmed that in order to be successful, health promotion strategies in child care settings will need to overcome tensions between providers and parents, allow professional growth of child care providers to some in a health promotions roll and better integrate external health resources and personal group sessions and peer learning opportunities that are culturally and linguistically sensitive.

**El-Aty, (2005)** uncovered the need for parent home accidents educational program especially for the mothers.

**Mohammadi, et al., (2005)** concluded that home visitation as a tool for face-to-face training with a sharper focus on burns, falls and drowning prevention can be recommended as a part of primary health care policy.

**Thein, et al., (2005)** reported that there is need to educate the parents and caregivers on precaution of home accidents and its first aid.
Morrongiello, et al., (2004) concludes that emphasis made on child based strategies never decrease the risk of injury to toddlers by the parental but the environmental strategies protect and decrease the children’s risk of home injury.

Towner and Dowswell, (2002) uncovered that the positive and sustained impact of community-based programmes on injury rates has not yet been demonstrated conclusively. There is a need to develop valid and reliable indicators of impact and outcome appropriate to community studies.

NATIONAL STUDIES:

Babu, et al., (2016) make known that the tailored injury prevention research in LMIC is urgently needed. Injury prevention strategies have to be made for the respective locales due to varied etiology and cultures. Emphasis on same preventive programs may not give same results everywhere. Efforts should be directed at reducing childhood injuries in the home. In developing countries, provision of creches, supervised nurseries at workplaces, increased awareness of risk factors in the peri-domestic environment, adequate parental supervision and child-friendly homes have been suggested. Large impacts of simple accident prevention programs in the peridomestic environment need to be exemplified. Also, the local injury patterns must be taken into account when formulating policies to address this unique challenge.

Suguna, (2015) conducted a study was on “Women’s awareness about domestic accidents among toddlers, in Kanyakumari, Tamilnadu”. The sample size was 300 mothers. Data on nature and types of domestic accidents showed that there is a need for well planned health educational program about causes of domestic accidents.

Devulkar and Kole, (2014) in a study assessed the effectiveness of structured teaching program on knowledge regarding prevention of household injuries among the mothers of toddlers in selected village of Belgaum. In the study, the mean post test score (26) was higher than the mean pretest knowledge score (10.16) which proved that STP (Structured Teaching Programme) was effective method in improving the knowledge of mothers. The paired‘t’ test
calculated value (49.4) was significant at p< 0.05 level of significance. It can be concluded that STP was an effective method of teaching the mothers of toddlers to improve the knowledge regarding prevention of household injuries.

Patel, et al., (2014) used an evaluative research approach with pre-experimental design to assess the effectiveness of structure teaching programme (STP) on knowledge regarding prevention of childhood accidents among 50 mothers of under five children at Piparia, Vadodara using non - probability convenient sampling technique. The tool consisted of demographic profile of the respondents and the section second consisted of 30 items to find the knowledge component of childhood accident. Result of the study indicates that the post-test knowledge score was in the range of (20-29) which was higher than the pre-test knowledge score range (11-17) and the mean post-test knowledge score (24.14) was also higher than the mean pre-test knowledge score (13.84). The comparison showed that there was a significant gain in knowledge scores of mothers after STP. The study findings revealed that structured teaching programme was highly effective in improving knowledge of mothers regarding childhood accidents.

Rastogi, et al., (2014) carried out a prospective study at the trauma centre attached to a King George Medical University in Northern India over a 12 month period on a total of 748 patients with trauma admitted between August 2008 to July 2009 chosen by random assortment. This study demonstrated that the majority of injuries in developing countries are preventable. A greater level of awareness of safety on the roads, home, workplace is required at all levels with the development and implementation of safety policies and programs. This can be done by educating the public through the media.

Sonavane and Bhondaw, (2013) carried out a descriptive evaluatory research approach to find the effectiveness of self instructional module (SIM) on knowledge of 40 parents regarding prevention of domestic accidents among the under five children in the selected urban areas using the pre-experimental one group pre-test post-test design and 30 item questionnaires. The post test score reveals that after planned teaching programme there was a boost in the number of sample from poor, and average range to excellent and good range. The calculated
value of t was found to be 37.048 for knowledge. These results support the significance of self instructional module in the improvement of knowledge score of the parents.

**Zaidi, et al., (2013)** to describe the patterns of injuries among children of rural and urban registered areas under department of community medicine, JNMC, Aligarh conducted a 282 household’s survey. Community based cross-sectional study was carried out. A standard questionnaire was administered to guardians of 91 of these children to elicit information on the etiology of the injury, demographic and socioeconomic details. Study results revealed that to prevent injury successful prevention strategies should include multifaceted approaches.

**Gupta, et al., (2010)** revealed that to reduce the incidence of burns and also to improve the burn care through research and training under the aegis of National academy of burns, India, academic activities like conferences, CMEs, workshops, training, a national journal and public awareness programme through radio and TV were started. The key strategies of preventive programme were the development and implementation of an appropriate, need based communication/bcc strategy.

**Kumawat, (2009)** in a descriptive study to assess the mother’s knowledge on their practices in prevention of home accidents among toddlers in selected rural community at Bangalore emphasized the importance of safety awareness among parents’ who have toddlers. Parent educations are the key determinants in domestic accidents prevention and provision of safe environment is very important.

**Gururaj, (2008)** divulged that there is need to develop a national policy and strategies for injury prevention and control with a major thrust on reduction of RTIs, suicides, burn injuries, work-related injuries and violence, which would be integrated, co-ordinated, cost effective and sustainable. Also, there is need to develop a comprehensive national policy on building an effective trauma care
system, and to urgently facilitate mechanisms for capacity building, strengthening the knowledge base and promoting research across all related sectors.

Intercountry Consultation Manesar, Haryana, India, (2004) in an report on “Strengthening Injury Prevention and Control (IPC) in Medical and Nursing Education Programmes” in the countries of the South -East Asia Region, for India recommended: (1) Strengthening of the IPC component in the medical and nursing curriculum by the Indian Nursing Council and the Medical Council of India respectively. (2) Preparation of modules for the training of trainers and reorientation of trainers. (3) Implementation of the revised curriculum by schools/colleges.

Resultantly, from all the studies it can be concluded that effective and easily adaptable interventions are the need of the hour and measuring the impact of these interventions through well-designed research methods is vital. The supportive study suggests the similar that the cost and cost-effectiveness analysis of interventions is urgently called for (Mathers, 2008). But a study concluded that injuries in low- and middle- income countries are on the rise due to a number of factors including lack of investments in safety interventions and appropriate research (Bishai, et al., 2003). Consequently, primary prevention intervention need to be included which aim at stopping injury events from taking place before injuries actually occur as well as efforts should be made to link specific injury problems with specific solutions and should involve multidisciplinary, collaborative and sustainable approaches based on best practices while being culturally and linguistically specific and sensitive. These would be definitely effective in reducing hospitalizations, injury severity, and mortality rates, in addition to being cost-effective.

(D). IMPORTANCE AND EFFECTIVENESS OF MULTIMEDIA IN INJURY PREVENTION.

The advent of multimedia, its technologies and applications are possibly one of the most exhilarating innovations in the age of information evolution. The
multimedia has dig up its own kind of space as a tool of educational and instructional technology for facilitating learning of the multi-disciplinary masses exhibiting a wide range of abilities. Also it offers the opportunity to simulate reality and therefore can aid experiential learning. Ogunbote and Adesoye in (2006) articulated that the learning experience have being heighted by the use of multi-media technology as the concepts became simpler to present and understand when the words are harmonized with the images and animations and make learning more significant and approachable to the localize and definite needs of the learners (Omagbemi, et al., 2004).

INTERNATIONAL STUDIES:

Lafta, et al., (2014) divulged that the women in Baghdad are poorly educated about the prevention of domestic accidents involving children. This finding is alarming and needs rapid and active measures to prevent such accidents by conducting education programs via mass media, including information about accident prevention in school curricula and creating group education sessions in primary health care centers.

Zaidi, et al., (2013) reported in their study that the need of International attention to injuries in terms of both policies and resource investments is lacking regardless of the size of the burden of childhood injuries and the known potential for prevention. The all-around approaches like education, incentive for safe human behavior, environmental changes and legislation/enforcement need to be inculcated for the preventive strategies to be successful. Some examples are the media campaigns that raise awareness and educate people particularly the care givers about the different ways to prevent injuries.

Schepens, et al., (2011) revealed that fifty-three older adults were randomized to two educational groups or a control group to find out whether multimedia fall prevention education which uses dissimilar instructional strategies amplify the older adults’ knowledge regarding the fall threats and also their fall prevention behaviors. Multimedia-based educational interventions had two tailoring strategies:(1) improve content realism for individual learners
(authenticity group) and (2) highlight program goals and benefits while using participants’ content selections (motivation group). Results revealed that intervention group participants showed greater knowledge gains and posttest knowledge than did control group participants. From study results it can be concluded that tailoring fall prevention education by addressing authenticity and motivation successfully improved fall threats knowledge. The study results supports that tailored fall prevention education which is multimedia-based, is an effective intervention for improving knowledge and behaviors. Future research on the long-term effects of tailored fall prevention education is warranted.

Correale, et al., (2010) in the study examined influences on parents’ decision making for booster seat use in two Canadian provinces; British Columbia and Manitoba. Although parents in both provinces did not differ on the perceived safety benefits of using booster seats they did significantly differ on their intent to use them. British Columbian parents reported significantly higher exposure to multimedia messaging about booster seats and knew booster seats were legally required for children under 9 years of age in contrast to Manitoba parents. The results suggest that legislation and knowledge of the legislation for booster seat use may impact usage within Canada.

Kakefuda, et al., (2010) carried out the study whose aim was to correct the perception of parents regarding small children’s susceptibility to unintentional injuries. For this they were exposed to computer-generated short animations of five typical injurious situations in Japanese home environments and information about injury susceptibility and severity was given. Animations depicted: falling from a chair; electrical shock at an outlet; bathtub drowning; accidental ingestion of a button battery; and thermal injury by a rice cooker. A total of 91 parents, including seven males, with children between 0.5 and 2 years old participated in the study through the Internet. Half of the participants (n=44) watched only the five animations (Animation-only). The other half (n=47) watched the five animations and information about injury susceptibility and severity (animation + information). The Animation + information group perceived their own children’s susceptibility to the injuries higher than the Animation-only group, and the
differences between the two groups were statistically significant in three of the five situations; fall, thermal injury, and drowning. Results suggest that animation is useful to get parents attention to childhood injury and severity by showing the moment of injury; however, adding information about injury consequences may be more effective in increasing parental feelings of injury susceptibility of own children.

McLaughlin and Glang, (2010) aimed to evaluate an eHealth software program called “Bike Smart” program whose purpose was to teach bicycle safety behavior to the young children in a suburban school in Pacific Northwest. The sample consisted of 206 children from kindergarten to grade 3. To evaluate the program a random control design was used, and either the treatment condition (Bike Smart) or the control condition (a video on childhood safety) was assigned to the children. The computer based knowledge items that were included as outcome measure were the safety rules, hazard discrimination and the helmet placement. The outcome revealed that despite of gender, cohort, and grade the participants of the treatment group demonstrated better gains in computer-presented knowledge items ($p > .01$) as well as for the observational helmet measure ($p > .05$) than the control participants.

Snowdon, et al., (2008) to find the effectiveness of a multimedia intervention on parents' knowledge and use of vehicle safety systems for children carried out a multisite intervention study using a pretest-posttest design in four Ontario cities. To test the effectiveness of an educational program on parents' knowledge of safety system use for children (0-12 years) 6 weeks following the educational intervention was carried out. The sample consisted of 418 families who reported on 732 children. Results indicated that knowledge increased significantly following the intervention. Use of professional sources of information was an important factor that is linked with increased parents' knowledge.
NATIONAL STUDIES

Rastogi, et al., (2014) conducted a prospective study at the trauma centre attached to a King George Medical University in Northern India over a 12 month period. A total of 748 patients with trauma admitted between August 2008 to July 2009 were chosen by random assortment. This study demonstrated that the majority of injuries in developing countries are preventable. A greater level of awareness of safety on the roads, home, workplace is required at all levels with the development and implementation of safety policies and programs. This can be done by educating the public through the media.

Shrestha, et al., (2014) to assess the knowledge of mothers regarding prevention of minor accidents among children carried out a study. The sample size was 100 mothers attending MCH clinic and having at least one toddler at Taddah, Nepal. The devices used for data collection was knowledge questionnaire on minor accident prevention. The study reveals that people should be educated and made aware about accident preventive measures in infant and toddlers through different means such as media which may help to prevent from accident.

Shriyan, et al., (2014) conducted a cross-sectional study to know the profile of unintentional injuries among the children under the age of five in coastal Karnataka, from October to November, 2014 who attended the anganwadis in Udupi Taluk. The convenient sampling method which was time frame located was adopted and in total 95 mothers of children under the age of five were interviewed by using semi-structured questionnaire which was administered by the interviewer. The study results discovered that to deal with unintentional injuries concentrated health education activities would be supportive for mothers on the causes and prevention of childhood injuries. Using the media for mass awareness campaigns on first aid can be a good step forward to prevent injuries.

Overall, it can be summarized that despite the computer technology being an integral part of health care as revealed by Hornung, et al., (2000), attractive to health educators in schools (Buller, et al., 1999), can be effectively used through
kiosks to deliver injury prevention messages in pediatric emergency departments (Gielen, et al., 2006), learner learned by using an interactive multimedia very well (Glang, et al., 2005) and many more significance yet, there have been few studies exploring the use of multimedia technology in injury prevention, especially targeting children.