

An Action Plan towards Injury Free India from Womb to Tomb

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Research Article

Abstract: With the decline of communicable diseases, injuries are becoming one of the highest causes for death in India. According to WHO's World Health Report, injury will be 3rd leading cause of death in India by year 2020. Health and safety is a fundamental right of every human being and it can only be maintained and improved if preventive measures are taken against risk factors. Ideas presented in different conceptual frameworks for injury prevention were studied and put together to create an action plan for injury prevention in India targeted at different age groups. This study gives an age-specific approach towards finding out risk factors and devises interventions. It targets wide spectrum of population i.e. from foetus to old age and is suitable for all kinds of unintentional injuries. The present statistics of injuries in India suggests that it is high time to take prompt action in field of injury prevention. This study is an initiative towards subject of injury prevention in India and highlights the method to do so. This study will not only create awareness among public with regards to injury prevention but also help government devise effective policies and legislations.

Introduction:

With decline of communicable and infectious diseases, injuries are increasing at rapid rate and have become leading health care problem in India. Moreover the attitude of people towards injuries is 'fate', 'destiny' or 'part of life'. Hence little effort is made towards preventing injuries.

Injury is defined as a body lesion resulting from acute exposure to sudden mechanical, electrical, thermal, chemical or radiation energy interacting with body in amounts that exceed the threshold of physiological tolerance¹. Injuries are non communicable diseases which are predictable hence preventable.

Injury pattern differ according to age, so there is a need to devise an age-specific injury prevention framework in Indian settings.

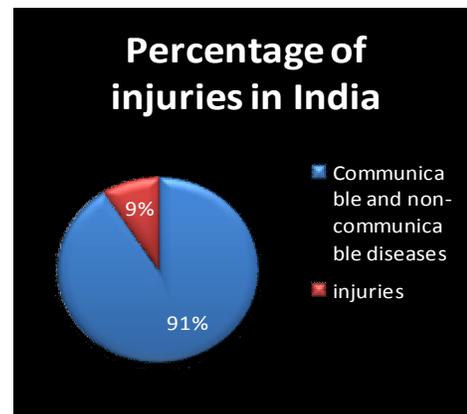


Fig. 1. Percentage of injuries in India, 2009 SOURCE: NIMHANS, Bangalore

The incidence of accidental deaths has shown a mixed trend during 1999-2009 with an increase of 31.3% in the year 2009 as compared to 1999. A total of 3,57,021 injury related deaths were reported in the country during year 2009¹⁸. The following pie-chart shows percentage share of various causes of accidental deaths during 2009.

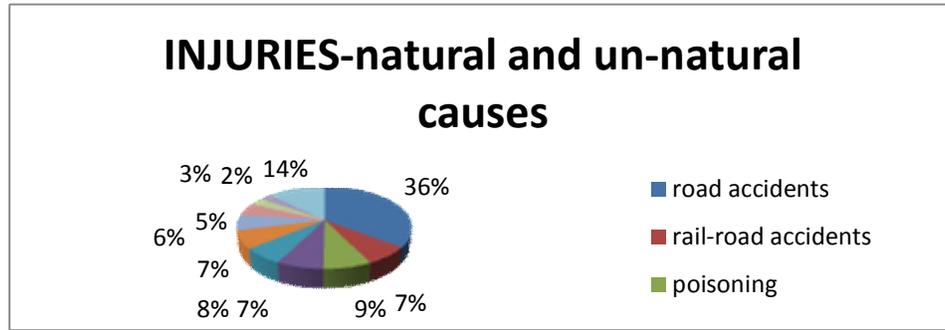


Fig 2. Pie chart showing percentage share of various causes of accidental deaths during 2009
SOURCE: NATIONAL CRIME REPORT BUREAU, 2009

The young and middle aged group are primarily affected by injuries.

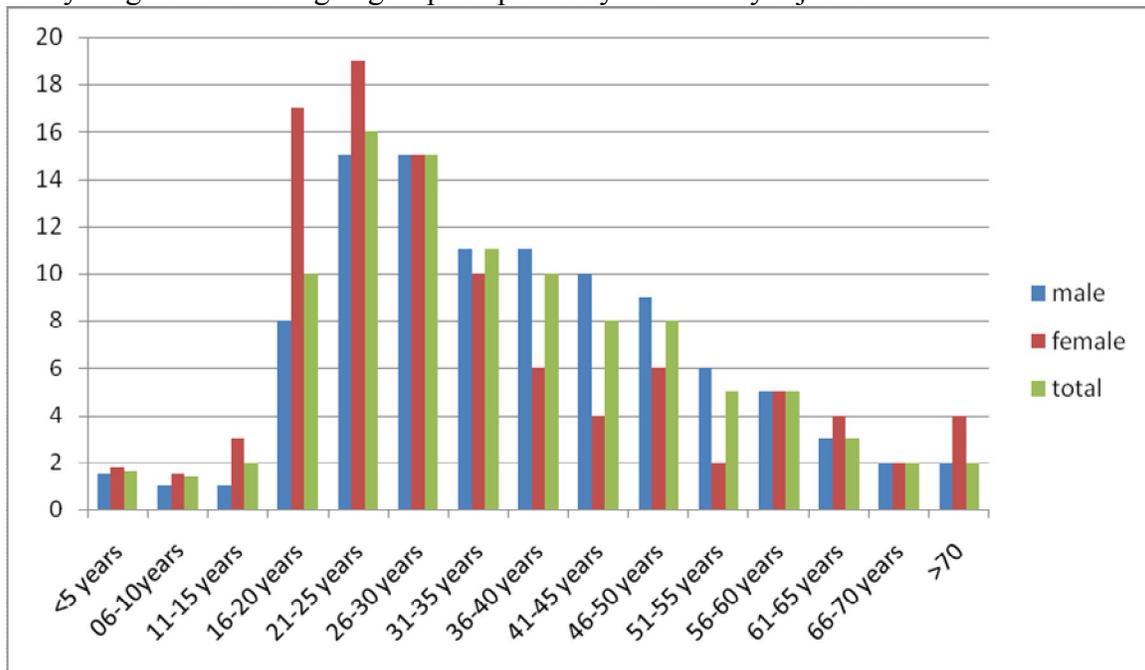


Fig. 4. Percentage distribution of injuries in different age groups.
SOURCE: NIMHANS, BANGALORE

A) Injuries to Foetus due to Maternal Trauma:

The vulnerability of pregnant female and potential injury to the unborn child serves as reminder of creating injury free environment to mother as well as foetus. In addition pregnant woman is at highest risk of accidental trauma due to fainting spells, excessive fatigue, physiological changes that affect balance and co-ordination in late pregnancy.

Trauma from domestic violence, road traffic accidents and falls are most common in India. Proper seat belt use is the most significant modifiable factor in decreasing maternal and foetal injury and mortality after motor vehicle crashes.

Domestic violence are often under reported out of shame or because they do not view certain acts as

violence. There is evidence of association between experience of violence during pregnancy and mortality. A study of maternal mortality rate that explored, in depth, causes of 121 maternal death reports showed that second largest cause of death in pregnancy (nearly 16%) resulted from complication associated with the experience of domestic violence (Ganatra, Coyaji and Rao,1998). Therefore, it is recommended that the pregnant woman should know the system to prevent domestic violence. The ministry of Human Resource Development has circulated the draft- Protection from Domestic violence bill,2001 and introduced in Monsoon Session of Parliament in 2003.

B) Injury in Age Group 0-15 Years:

This age group comprises of infants and school going children who mostly depend on surrounding environment to be free from injury. Childhood injuries occur mostly because parents and care takers undermine the capability of their kids. Developmental milestones in a child are also an indicator of increased risk on injuries in children.

Newborns to 5 months old have limited mobility, so most of the injuries occur due to caretaker's fault or neglect. Active toddlers can have gasoline like products by trying to reach places where they couldn't in past. By 9-11 months they put anything they can lay hands on in mouth including toys, buttons, coins, etc. These can enter tiny esophageal passage and choke them. Children less than 4 years of age can misjudge their movements causing them to fall. Hot liquids and vapour can scald a baby easily since their skin is thin and soft. The intense curiosity of children to try to experiment with anything they can find peaks around 21-24 months.

As per WHO estimates, nearly 950000 children die in the world due to an injury each year. The burden of childhood injuries in India is not clearly known, as injury information has not received much importance. National Crime Report Bureau data reveal that nearly 15-20% of injury deaths occur among children. Children with disabilities after an injury lead life with persistent disabilities for rest of life. As per the NCRB report of 2006, there were 22,766 deaths (<14 years) due to injuries among children.

C) Injuries in Age Group Of 16-50 Years:

This group accounts for the productive population of country, and the most to be affected by injuries. Road traffic accidents are the prime cause of injury related deaths in these age groups. According to NCRB data for year 2006, 63% of death and 76% of injuries due to road traffic injuries were in 15-44 year age group. Study by NIMHANS, Bangalore pointed out that extreme low usage of helmets (50%) and seat belts (<15%) was responsible for injuries and deaths, despite presence of law for both. A broad understanding of causes revealed that speed is one of the major contributing factor for road death and crashes.

D) Injuries in Age Group Of More Than 50 Years:

Although the main cause of death in this age group is cardiovascular diseases, but injury like falls and fractures are not uncommon in this age group. As a group, geriatric patients tend to respond to injury less favourably than young patients. Geriatric patients who

are injured are more likely to experience fatal outcome, even if the injury is of a relative low severity. Vision, hearing loco-motor functions, reflexes begin to decline gradually.

Data from NCRB for year 2006 indicate that 34594 elderly individuals lost their life due to an injury. Among various type of injuries, road traffic injuries and falls are found to be the leading cause of injury.

Method:

Integrative approach was taken towards various conceptual frameworks for injury prevention and applied in Indian scenario. The success of conceptual studies like Haddon's Matrix, Haddon's 10 strategies, the 3 E model, socio-ecological model, behaviour change theories led us to use these studies as a framework for creating a unique model aimed at different age groups¹.

The injury pattern in India was studied from *Injury and Violence in India: Facts and Figures* published by NIMHANS, Bangalore in 2011¹⁸. Age was considered as basic parameter on which module was created since different injuries are observed in different age groups. Study focuses more on preventive and safety promotion strategies at pre-event and event phase of injury.

Module for Injury Prevention:

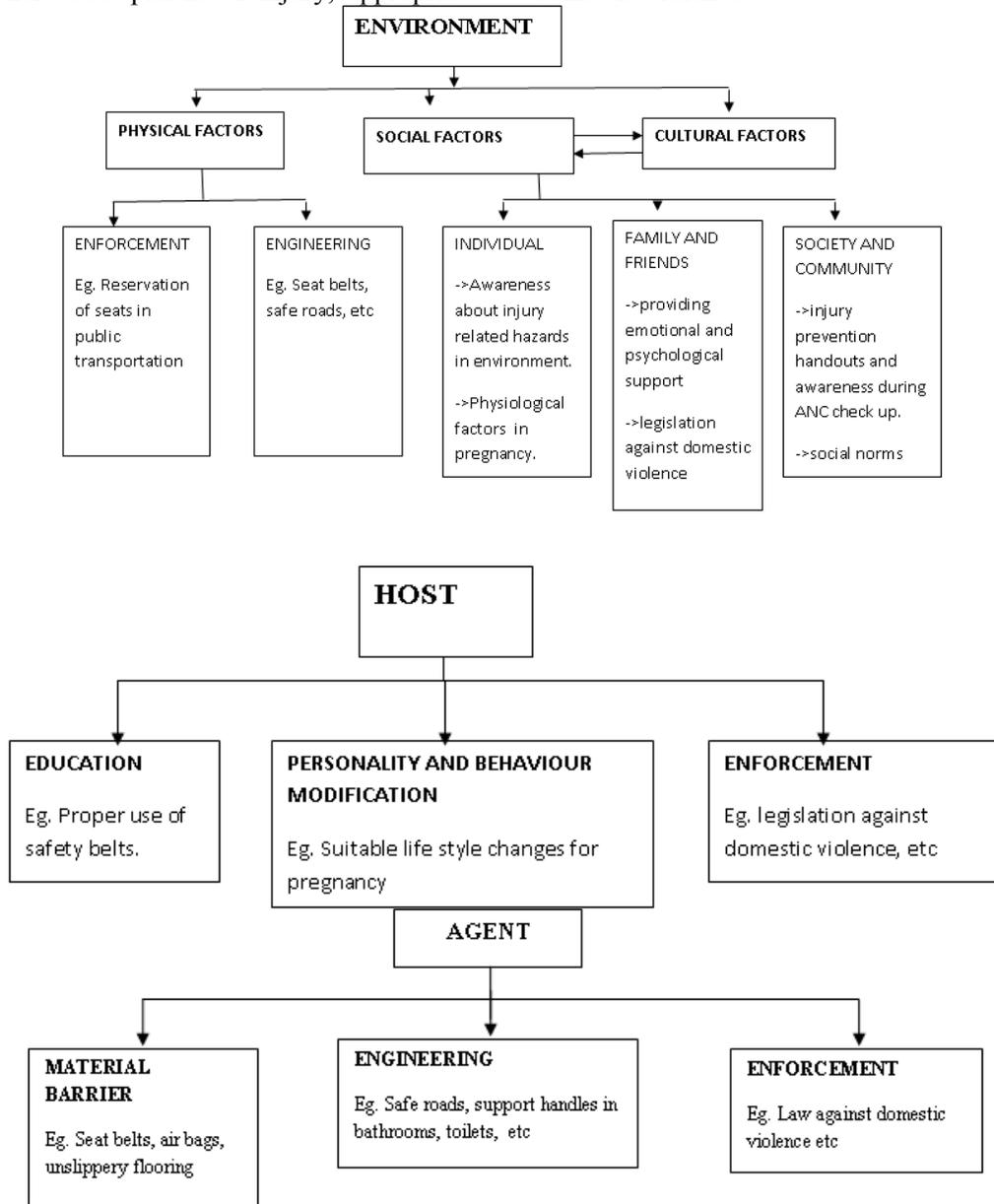
The complexities of injury problems require complementary rather than competitive prevention strategies. This study is not a critical study but an assimilative study which is a need of time with limited resources. Preventive measures are taken at 3 levels in the module- agent, host and environment.

E) Module for Injury Prevention at Foetal Level:

A foetus which is directly or indirectly affected as a result of an in utero injury insult to itself or the mother (excluding birth related trauma), that dies either prior to birth or up to and including 27 days after birth is called foetal injury.

This module is created with an idea of preventing in-utero trauma to foetus due to non-obstetric causes. The module focuses on modification of environment for safety of not only mother but also the foetus. It includes physical and socio-cultural factors. The physical factors responsible for injury should be modified using engineering and enforcement (eg. Proper use of safety belt by pregnant female, reservation of seats in public transport). The socio-cultural factors come into being to prevent foetal

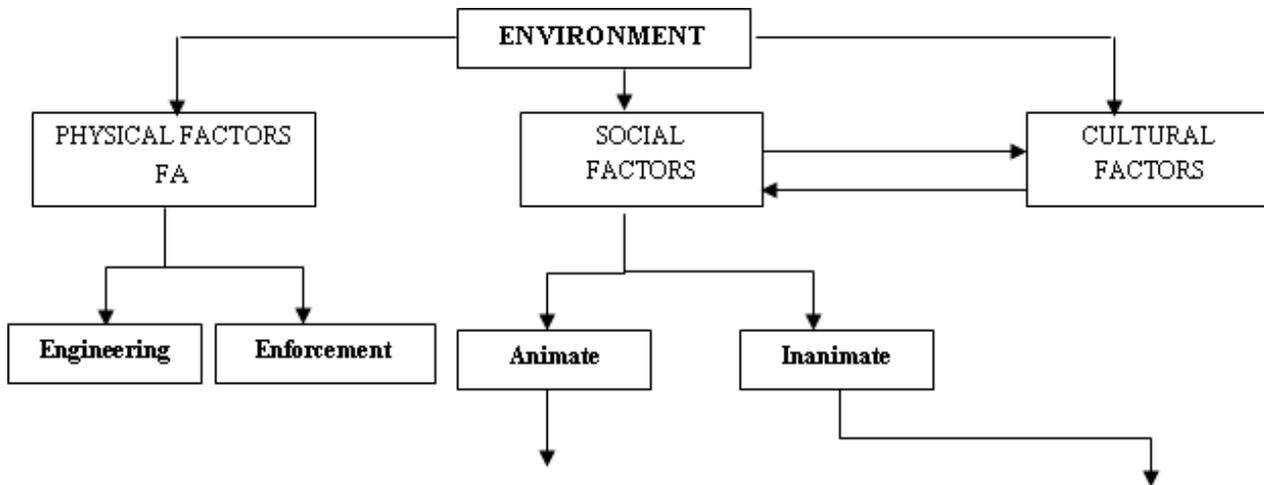
injuries due to domestic violence. Host factors include educating mother about pitfalls of injury, appropriate lifestyle changes for birth of baby and legislations for domestic violence.



F) Module for Injury Prevention at 0-15 Years Of Age

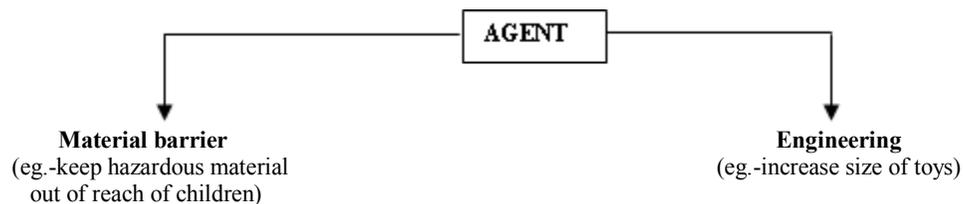
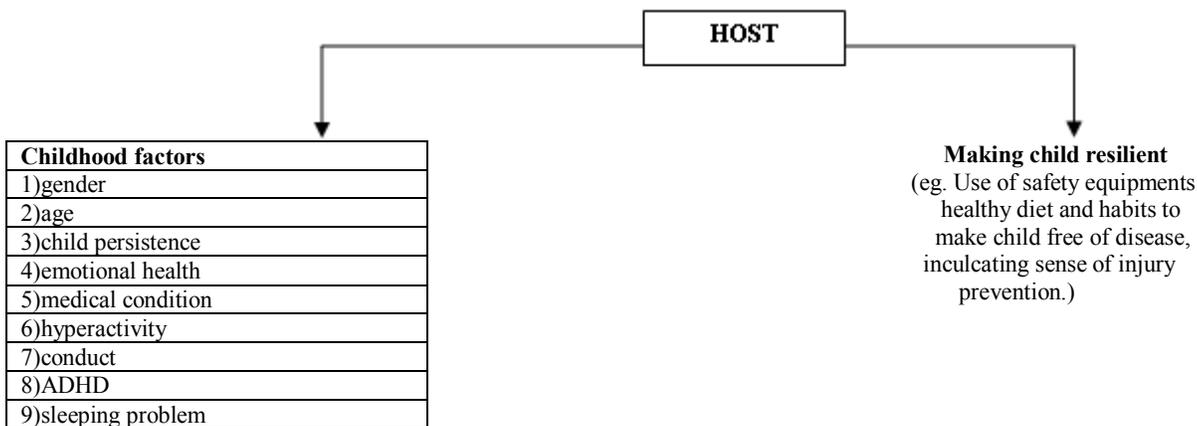
This age group relies on society for its welfare and well being. It is the society’s responsibility to make sure that the child is safe. Factors which influence injury free environment are family and friends as well as contextual factors like neighbourhood, density of

population, noise, heavy traffic and number of homes. The most important factor being parenting skills. Parents should be well aware of childhood factors like persistence of child, curiosity, hyperactivity, medical conditions, sleep disorders etc which make them easy prey of injuries.



Family And friends	community	society
1)education	Social norms and marketing campaigns to foster healthy relationship	Health, education, economic and social policies
2)parenting skills		
3)mental condition		
4)stressful life events		
5)foster problem solving, promote healthy relationship		

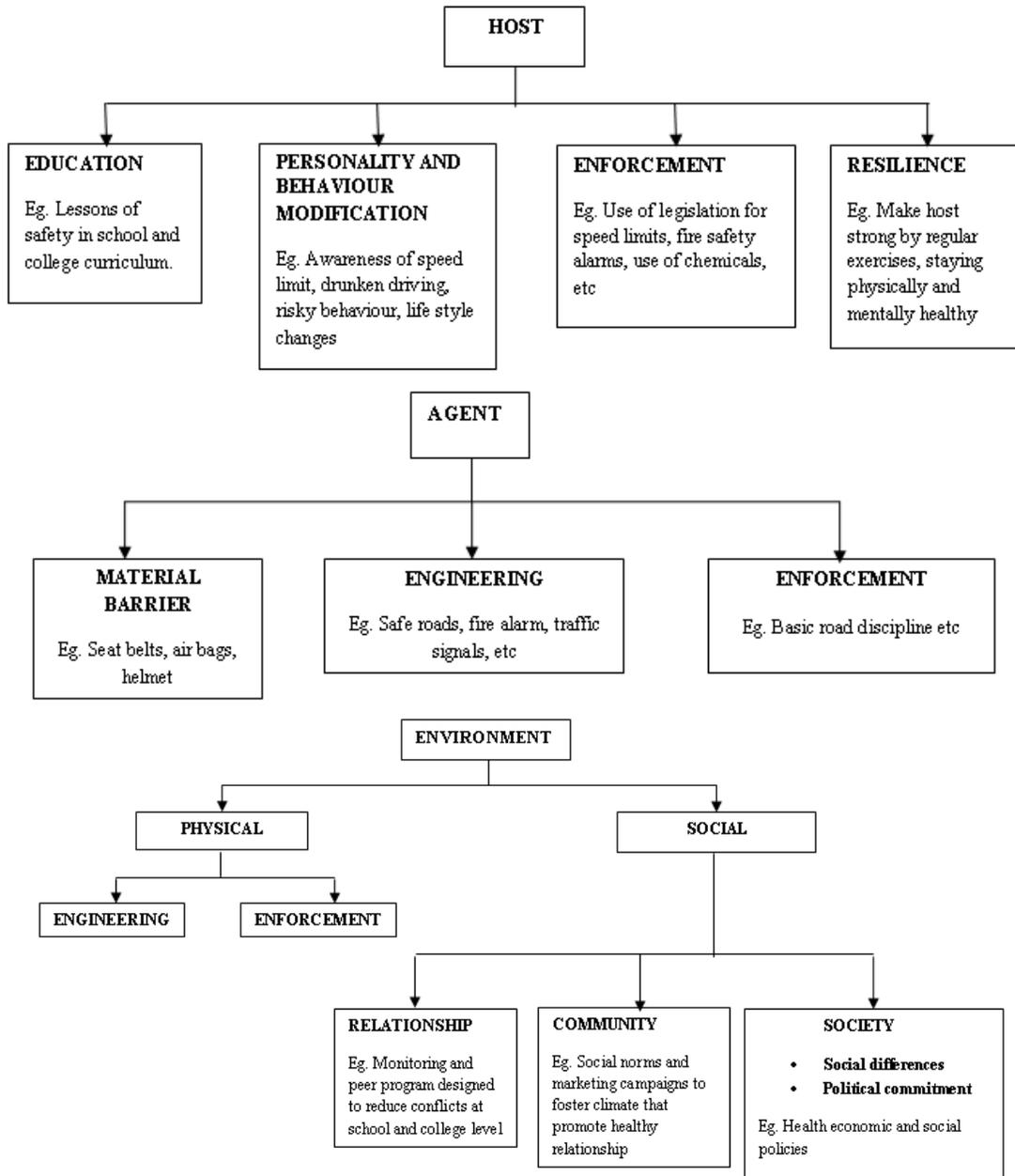
Contextual factors
1)neighbourhood liveability
2)number of homes
3)public housing
4)noise
5)heavy traffic



Module for Injury Prevention at 15-50 Years of Age

This module focuses on inculcating the importance of safety promotion and injury prevention in the minds of

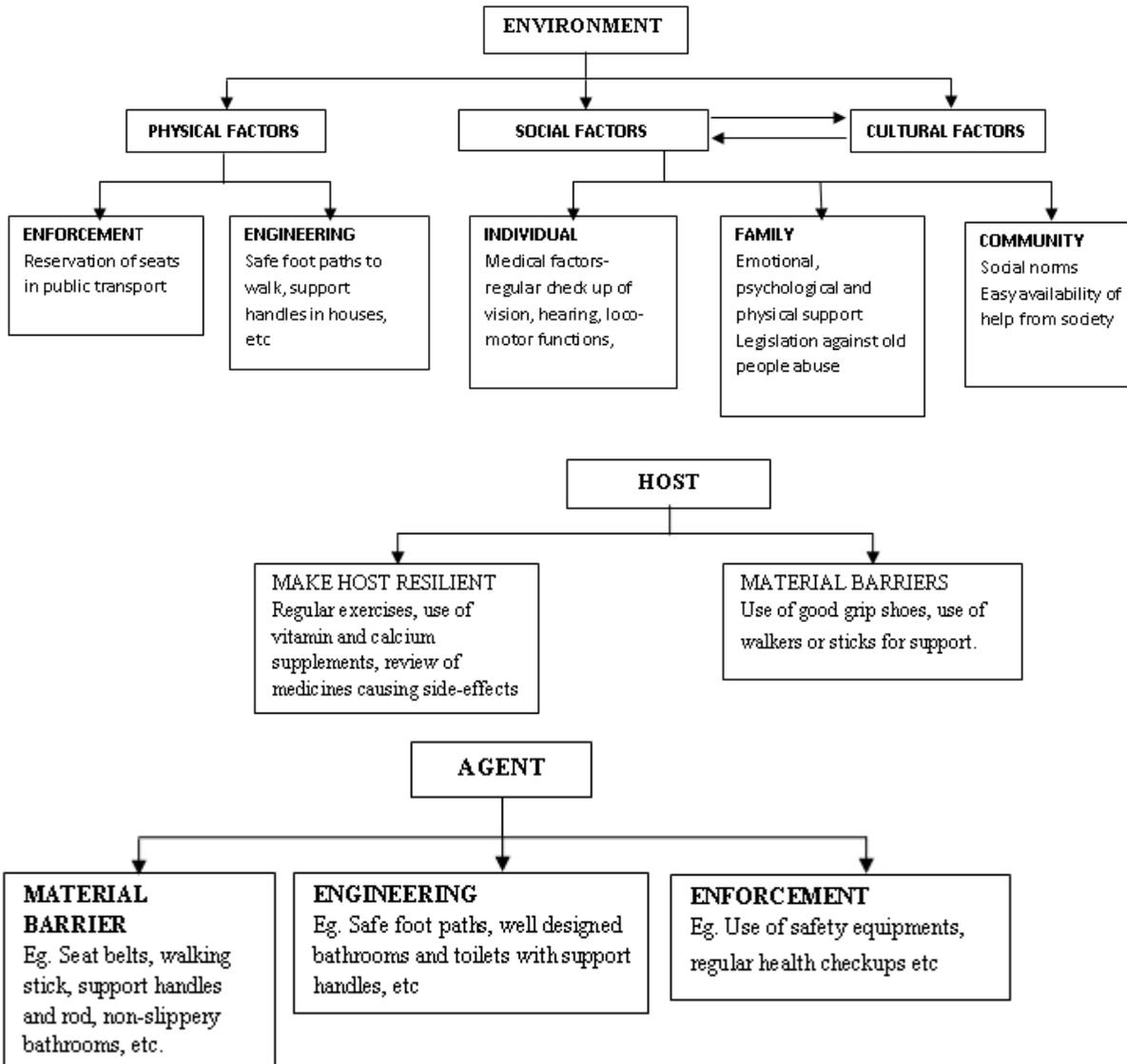
young people through education and life style changes. It gives prime importance to host education and behaviour modification for safer surrounding.



Module for Injury Prevention for >50 Years Age Group:

As the age advances there is gradual decline in vision, hearing, reflexes and loco-motor functions. Hence environmental modification should be carried out at

physical and social level. Host factors include becoming resilient by regular exercises, eye and ear checkups, reduce or stop usage of alcohol, barbiturates and sedatives which hamper their stability.



Strategies for Intervention

Based on the modules different strategies can be thought of at household level, work place level and in different surroundings.

Hand-outs can be given to different age groups showing what can be done to prevent all kinds of basic injuries. Check lists can be made using the above modules for different environment settings and for different age groups.

Injury audit can be done by an injury consultant. Depending on the module an INJURY SCORE can be made and used to determine the safety of the environment. A ranking system of 0 to 10 can be given and classified as very safe, moderately safe, unsafe or dangerous. This scale can be used for lay persons to devise intervention at household stage as well as in work places to prevent occupational hazards.

Scoring system can be devised for each age groups for specific injuries and evaluated by a safety officer who can then suggest suitable and feasible changes in surrounding and life style.

Discussion

Prevention is always better than cure. Injury is a non communicable disease which can happen at any point of time in life. It is of the disease where risk factors are easily found out hence its predictable and preventable. Lack of focus on injury prevention in India has made injury, one of the leading cause of death. An attempt is made to create age wise module for safety promotion and injury prevention based on conceptual frameworks already designed. Widespread use of frameworks like Haddon’s matrix, the 3 E’s model, socio-ecologic model, behavioural intervention theories and Haddon’s

10 strategies is done. Focus is maintained on unintentional injuries and preventive strategies associated to pre-event and event phase of injury. If proper steps are taken from before the time of birth and values of safety promotion are inculcated in each individual from childhood, then it can become easy to create an injury free environment.

Further studies need to be done on these modules to check its effectiveness and modified accordingly. Studies in this regard have been done in Nordic countries and significant change has been observed after intervention, making them one of the countries with least injury related deaths.

These modules can be applied by lay person to create a safe surrounding around them and also by the government to create effective policies and legislations.

Conclusion:

Injury related death is becoming one of the foremost problems in India, which is not looked upon. Prompt action is the need of time. Accident rates have not fallen despite legislations and economic growth. There is a growing need to create public awareness regarding this issue. This study is an effort towards sensitization of injury prevention in India.

Based on last 3 to 4 decades of research, experiences and lessons learnt from different communities, it is now evident that injuries of all types can be reduced even with available knowledge and understanding. The new understanding suggests that injury prevention and control is possible and feasible. It requires strong political commitment, policy maker's co-operation, professional participation and public involvement. It needs an inter sectoral approach involving professionals from field of health care, engineering, economics, police, management, education, media, social welfare and others. It is dependent on joint co-ordinated activities, independent monitoring and supervision of policies and programmes along with research. Injury prevention policies should be based on local, regional and national analysis of data collected through well designed information system. There should be systematic monitoring and evaluation of all policies and interventions to measure decline in actual reduction of deaths, hospitalization and disabilities.

References:

- [1] Anderson R, Menckel E. 'On the prevention of accidents and injuries – a comparative analysis of conceptual frameworks' *Accid, Anal. And Prev.* 27:757-768.1995

- [2] Curry P, Ramiah R, Vavila MS. Current trends and update on injury prevention. *Int J Crit Illn Inj Sci*; 1:57-65. 2011
- [3] Dandona R, Kumar GA, Ivers R et al. Characteristics of non-fatal injuries in rural India. *Inj Prev* 16:166-171.2010
- [4] Runyan CW. Introduction: back to the future- revisiting Haddon's conceptualization of injury epidemiology and prevention. *Epidemiologic Reviews* 25(1):60-64. 2003
- [5] Peek-Asa C, Zwerling C. Role of Environmental interventions in injury control and prevention. *Epidem Rev* 25(1):77-89. 2003
- [6] Shope JT. Influences on youthful driving behaviour and their potential for guiding interventions to reduce crashes. *Inj Prev* 12: 9-14. 2006
- [7] Geller ES, Berry TD et al. A conceptual framework for developing and evaluating behaviour change interventions for injury control. *Health education and research* 5(2):125-137, 1990
- [8] Gielen AC, Sleet D. Application of behaviour change theories and methods to injury prevention *Epidem Rev* 25(1):65-76.2003
- [9] Gulliver P, Begg D. Personality factors as predictors of persistent risky driving behaviour and crash involvement among young adults. *Inj Prev*; 13: 376-381. 2007
- [10] Weiss et al. Fetal death due to maternal trauma. *JAMA* 286(15): 1863. 2001
- [11] Blakemore T. Examining potential risk factors, pathways and processes associated with childhood injury in the longitudinal study of Australian children. Australian Govt. Dept of FaCSIA. 2006
- [12] Songer T et al. Core competencies for Injury and Violence Prevention and Control. *Am J Public Health*; 99(4): 600-606. 2009, April
- [13] Jagnoor et al. Road traffic injury prevention: a public health challenge. *Ind J of community medicine*; 31(3):129-131. 2006, September.
- [14] G Gururaj and Bangalore Road Safety and Injury Prevention Program Collaborators Group. Bangalore Road Safety and Injury Prevention Program: Results and learning 2007 - 2010, Publication No. 81, National Institute of Mental Health and Neuro Sciences, Bangalore, 2011
- [15] WHO project ICP DPR 001. Injury prevention and control in South east Asia region- Report of an inter country consultation, Bangkok. 2006, 23-26 January
- [16] Ministry of labour and employment, Govt of India. National Policy on safety health and environment at work place.
- [17] www.cdc.gov/injury/pdfs/Injuries_Violence_Worldwide.pdf
- [18] Injuries and violence in India: Facts and Figures by NIMHANS, Bangalore, 2011.
- [19] Bawa H, Joshi P et al. Interior Health: injury prevention environmental scan. BC Injury research and prevention unit, 2007 April.