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ENABLING A CULTURE OF DISASTER PREPAREDNESS: INTRODUCTION OF DISASTER MANAGEMENT IN SCHOOL CURRICULUM - A CASE STUDY OF KENDRIYA VIDYALAYA SCHOOLS IN CHENNAI

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ABSTRACT:

Disaster Management was introduced in School Curricula in India after the devastating 2001 earthquake in Gujarat with an objective of making children learn about disaster management was to go beyond saving the lives of school children and school safety, to educate the community about better management of disasters. While preparation of school disaster management plans and conduct of mock drills aimed at saving the lives of school children by teaching them how to respond before, during and after the disasters, teaching them about hazards, prepared ness and mitigation as academic subjects aimed at enabling a culture of better disaster manage ment. It was envisaged that the knowledge impart-ed to children will not only provide them a sound under standing of the basics of disaster management but also spread beyond the school campus to the family of the children and thus to the society at large. Despite the fact that teaching and learning about disaster management in schools has been going on for nearly a decade, there is no empirical study to evaluate the impact of such an exercise. Hence this study has been carried out as a first attempt, based on field work questionnaire survey undertaken in the Kendriya Vidyalaya schools in Chennai, Tamil Nadu, evaluated the impact and critically examined the outcomes of the effort to usher in a culture of disaster preparedness as a result of introduction of disaster management in schools curriculum. Although the schools and teachers have been the source for imparting knowledge to the students and sharing with the community, students seem to be more prepared not only to face the emergency but also to welcome new changes.

KEY WORDS: School safety, Disaster management in schools, Culture of disaster prepared-ness.

INTRODUCTION:

Asia-Pacific is one of the most disaster-prone regions. In 2008 natural catastro-phes and man-made disasters caused 240,500 fatalities most of which happened in Asia (228,400).1 Children are often among the most vulnerable. The Wenchuan Earthquake in Sichuan, China, killed about 7,000 students who were trapped in damaged school buildings.

During the 2005 Kashmir earthquake around 8,000 school buildings collapsed and 18,000 children died.2 In 2005 hurricane Katrina led to the closure of 700 schools; in Louisiana 40 schools were destroyed and 875 were damaged and in Mississippi 16 schools were destroyed and 287 were damaged.

The Hyogo Framework for Action (HFA) was formulated as a comprehensive, action-oriented response to international concern about the growing impacts of disasters on individuals, communities and national development. It was adopted by 168 Governments at the World Conference on Disaster Reduction, held in Kobe, Japan, in January 2005. The HFA sets a clear expected outcome: "The substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries". In order to attain this outcome the HFA emphasizes the importance of disaster risk reduction (DRR) as a central issue for development policies and calls upon signatories to make DRR a priority. It stresses the "use of knowledge, innovation and education to build a culture of safety and resilience at all levels" as one of the five priorities of action with a focus on including disaster education in formal and non-formal education and protection of public facilities.3

The World Disaster Reduction Campaign 2006-2007 with the central theme of "Disaster Risk Reduction Begins at School". The aim was to encourage the integration of disaster risk education in school curricula and the safe construction and retrofitting of school buildings to withstand natural hazards.

The UN Center for Regional Development (UNCRD) emphasizes the multifaceted role of schools in building resilience of communities and in propagating a culture of safety to communities. Its School Earthquake Safety Initiative (SESI), under the theme of "Reducing Vulnerability of School Children to Earthquakes", aims to ensure that earthquake safe schools in seismic regions and that the local communities build capacity to cope with earthquake disasters.

The project is being implemented in Fiji, India, Indonesia, and Uzbekistan and comprises the following four components: 4

• Seismic retrofitting of school buildings: Seismic vulnerability analysis of selected schools and retrofitting of two to three schools typical to the region in each economy.
• Capacity building of communities: On-the-job training during retrofitting works for government officials and experts in the community such as masons.
• Disaster education and awareness raising: Development and wide distribution of educational materials for students, manuals for teachers, and guidelines for experts.
• Knowledge and experience dissemination: Regional and international workshops.

As we are approaching the end of the target period for the implementation of both the Hyogo Framework for Action 2005-2015 and the United Nations Decade of Education for Sustainable Development (2005-2014), it is widely agreed that education for disaster reduction must become an integral part of any educational system aiming at promoting and creating thriving and sustainable societies. Various initiatives have been taken worldwide to make school buildings safer and have disaster education taught in schools. Some of the initiatives made immediate impact while others laid the foundations for future successes but all helped schoolchildren fulfill a role envisioned for them: to serve as agents of disaster risk reduction, 5 since they are very effective communicators and disseminators of disaster risk reduction and preparedness messages at the family and community level

Most countries have taken the approach of supplementing curriculum with regional and national co-curricular education developed by civil protection agencies or civic organizations, often in

conjunction with wider public education campaigns. China, India, Mexico, New Zealand, and Turkey have co-curricular risk education in regional or national curriculum. Japan also has co-curricular risk education in some schools, though it has been removed from the national curriculum. In Mexico, environmental awareness, the interaction of humans and the environment, and disaster risk reduction and preparedness are taught in secondary school geography classes. As part of these studies, students participate in risk mitigation activities in their communities.

Some countries are currently considering adding risk awareness and risk reduction education into their educational mandates. In the United Kingdom, integration of hazard awareness and risk reduction is being discussed as part of a new citizenship curriculum. Segments of this citizenship curriculum may draw upon innovative risk awareness and reduction education in geography lessons developed by a secondary school teacher. These lessons ask students to learn about hazards in their neighborhood, country of origin or holiday destination, create educational videos and help their families better prepare for natural hazard events. In other countries such as Canada, Italy, and the United States, teaching material for risk awareness and risk reduction education in the schools is implemented on a voluntary basis.[6]

In China, nearly 500,000 textbooks on natural disasters and mitigation have been produced for elective high school geography courses, covering characteristics and impacts of natural hazards in China, hazard monitoring, mitigation, preparedness and disaster relief. In 2004, the National Text-book Authorization Committee for Primary and Middle Schools of China approved a text-book for senior middle schools on natural hazards which was distributed widely across the country: by 2006, there was a copy on every senior middle school student's desk. The book offers a thorough introduction to natural hazards in the world, with a more detailed focus on China, and pays particular attention to preparedness and DRR. In addition it provides a list of Chinese web sites that students and teachers can consult, including a site maintained by the Chinese Science Museum. The website of the virtual Earthquake Museum, for examples, features interactive games on earthquake response (Escape from an Earthquake in 10 seconds) and information on a range of topics including basic hazard awareness, Chinese seismographic history and earthquake risk management. The website is addressing both children and adults.[7]

New Zealand has a mandatory curriculum for risk awareness and reduction which is one of the most extensive ones in the Asia-Pacific region. [8]

Japan has the most successful education for natural disaster preparedness programs in its schools. After the March 2011 great East Japan earthquake, school teachers became much more interested in education for disaster prevention. Before March 2011, some elements of disaster prevention education were added to the new curriculum on Social Studies and geography. In Japan's elementary and secondary education, disaster prevention education is taught under the purview of health and physical education as a part of school safety education. However Disaster prevention education in the Social Studies and Geography syllabus on national curriculum standard was changed. In elementary school, the aim for disaster education is "getting to know disaster and engagements for disaster prevention." In junior school, students learn "regionality through disaster prevention." In senior high school, students learn about human-environment relationships in natural disasters, and brush up on map skill.[9]

The addition of Disaster Management knowledge to the school curriculum in India is a good step forward in Disaster Preparedness. Tragic incidences of collapse of schools in earthquakes, fire accidents tsunamis and other disasters that have resulted in the loss of lives of children emphasize the need for disaster preparedness in schools. Children in schools are unarguably the most vulnerable

segment of the population and are also the most impressionable. Lessons learnt during this period not only stays with them throughout their lives but also shared with the community. India, the second most populous country in the world has about one-third of its population, studying. With nearly 85% of the land area prone to disaster it is high time the 34% of the country's future generation has been prepared to combat future disasters. Creation of a culture of disaster preparedness requires that today's children who will be citizens of tomorrow to be informed and educated about all aspects related to disasters. Understanding this urgent need, Government of India, Ministry of Human Resource Development in its Tenth Five Year Plan emphasized the need for integrating disaster management in the existing education system in India. One of the important initiatives includes disaster management in the curriculum of school and professional education has been recommended to the Boards. Empowering the younger generation on the preventive aspects, the types of services to be rendered in a disaster situation and the need for humane approach form part of the curriculum.

In a first ever attempt by any educational institution in the country, the Central Board of Secondary Education (CBSE) has integrated a short course on Disaster Management into the school curriculum. The CBSE has introduced the subject on Disaster Management as a frontline curriculum in Social Science for Classes VIII in the year 2003, for Class IX in 2004 and for Class X in the year 2005. The Board has developed the curriculum, course content and the pedagogy with support from the Ministry of Home Affairs, Government of India and UNDP.[10]

Disaster Management was introduced in the School Curriculum during the period 2003-2005 in India with a view to enhance school safety. Though the objective was to make children better prepared for disaster management, the long-term objective was to foster a culture of disaster preparedness. The idea was to create a ripple effect to reach to homes and society at large through the young minds, who will become carriers of the message of a disaster safe India. The curriculum transaction on disaster management in schools intends to cross the boundaries of the curriculum, classrooms and schools and make the learning local-specific involving families and the community at large. The CBSE strongly believes that "educating a child is educating a family". It intends to generate awareness in the form of painting, debate and essay competitions, skits and exhibitions.[11]

Around 15383 (CBSE affiliation) schools[12] in the country follow CBSE curriculum and almost 12 million children are enrolled with it. The curriculum of standards VIII, IX, and XI were revised to include various aspects of disaster management. Class VIII focuses on preparedness measures to be taken by students and teachers for various disasters. Class IX focuses on mitigation measures. The syllabus of Class X discusses the role of government and other agencies in disaster management, role of science and technology in disaster management and initiating the concept of volunteerism among the children.

As recommended by the HFA[13], Government of India Ministry of Home Affairs and various State Governments have introduced Disaster Management in the school education. Some states like Gujarat, Tamil Nadu etc have already included Disaster Management in the text books. After almost 10 years it is necessary to understand how far the objective of introduction of disaster management has been progressed. It is therefore necessary to conduct an empirical study of different schools to understand how far this approach towards imparting knowledge of disaster management to young minds has succeeded. The proposed research will not only try to understand, the impacts and outcomes of introduction of disaster management in schools, but also how it can be more effective.

2. OBJECTIVE, STUDY AREA & METHODOLOGY

2.1 Objectives

The aim of this study is to find out the impact of introduction of Disaster management in the syllabus on disaster preparedness in schools, with the focus laid on the following.

- To verify through an empirical study whether introduction of disaster management has helped to foster a culture of disaster preparedness.
- To ascertain the impact on the students and other family members.
- To analyse the reasons for success or failure of the desired impact.

The study seeks to answer the following research Questions in order to achieve the goal.

- Do the schools have DM plans and what action is taken towards risk reduction?
- Are the students learning the basic principles of disaster management and preparedness?
- Are they better prepared in terms of knowing the dos and don'ts during disasters?
- Do they share their learning with their parents and other family members?
- Is this knowledge shared with the larger society by the adult members of the family?
- If sharing takes place, has this lead to better preparedness of the households?
- What are the problems and issues connected with teaching disaster management at school level?
- Reasons for success and failure in creating a culture of disaster preparedness.

2.2 Study Area.

The study area covers 8 (nearly 60%) Kendriya Vidyalaya schools out of the 14 located in Chennai Region. Kendriya Vidyalayas (1090 schools all over India) are pace setting Institutions in the field of education, which are run by the central government autonomous body "Kendriya Vidyalaya Sangathan" (KVS), under the Ministry of HRD, Govt. of India. The mission of KVS is to initiate and promote experimentation and innovations in education in collaboration with other bodies like the Central Board of Secondary Education (CBSE) and the National Council of Educational Research and Training (NCERT) etc. and cater to the educational needs of children of transferable Central Government including Defence and Para-military personnel by providing a common programme of education14; Kendriya Vidyalayas being models of miniature India comprising of students and teachers from different states, religion ,language, culture and from various economic backgrounds will definitely be appropriate to be chosen for study.

Chennai , the capital city of the south Indian state of Tamil Nadu is located on the Coromandel Coast off the Bay of Bengal and is the sixth most populous city in India . Chennai is classified as being in Seismic Zone III15, indicating a moderate risk of damage from earthquakes and gets most of its seasonal rainfall from the north–east monsoon winds, from mid–October to mid–December. Cyclones in the Bay of Bengal hit the city and lying very near the sea this city can also be affected by tsunamis. It is therefore very essential for everyone to be well equipped with knowledge to combat the situations of emergency.

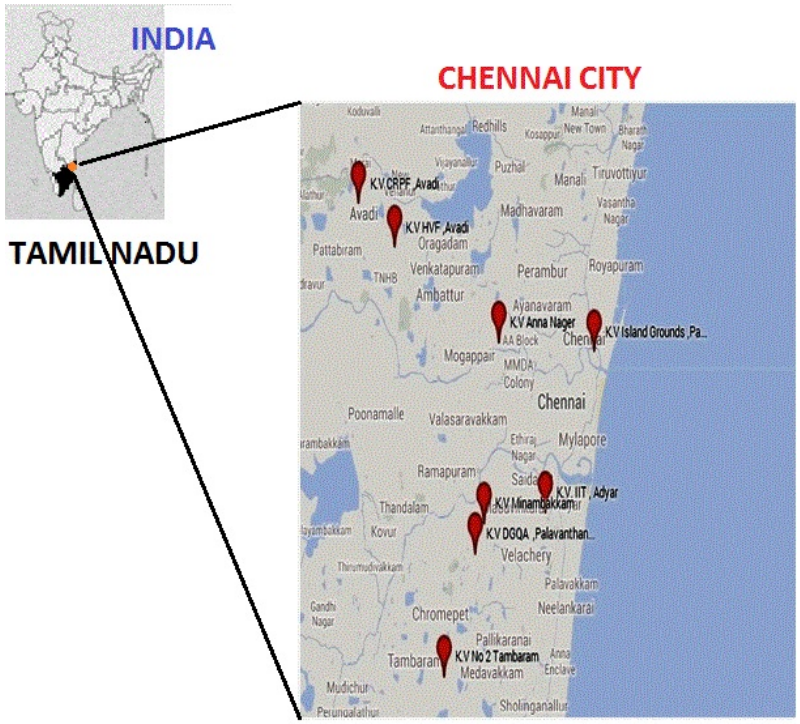


Fig. 1 Location map of study area

2.3 Methodology

Of the 14 Kendriya Vidyalayas in Chennai, 8 schools were selected randomly and included in the sample. In order to answer the research questions and fulfillment of the objective, a survey was undertaken in the form of questionnaire, distributed to 60 students (30 each in 9th and 10th classes) from each school, parents of these students, 10 of their teachers and principals of eight Central Government's, CBSE schools in Chennai. Out of these, 63 teachers, 383 students and their parents responded fully. This paper is presented based on the quantitative analysis of the data collected. SPSS (Statistical Package for Social Surveys) is used for data management and the analysis of the data. Statistics such as simple frequency tables, cross tabulations and chi square test are used to analyse the data and establish the association between the variables.

Data collection

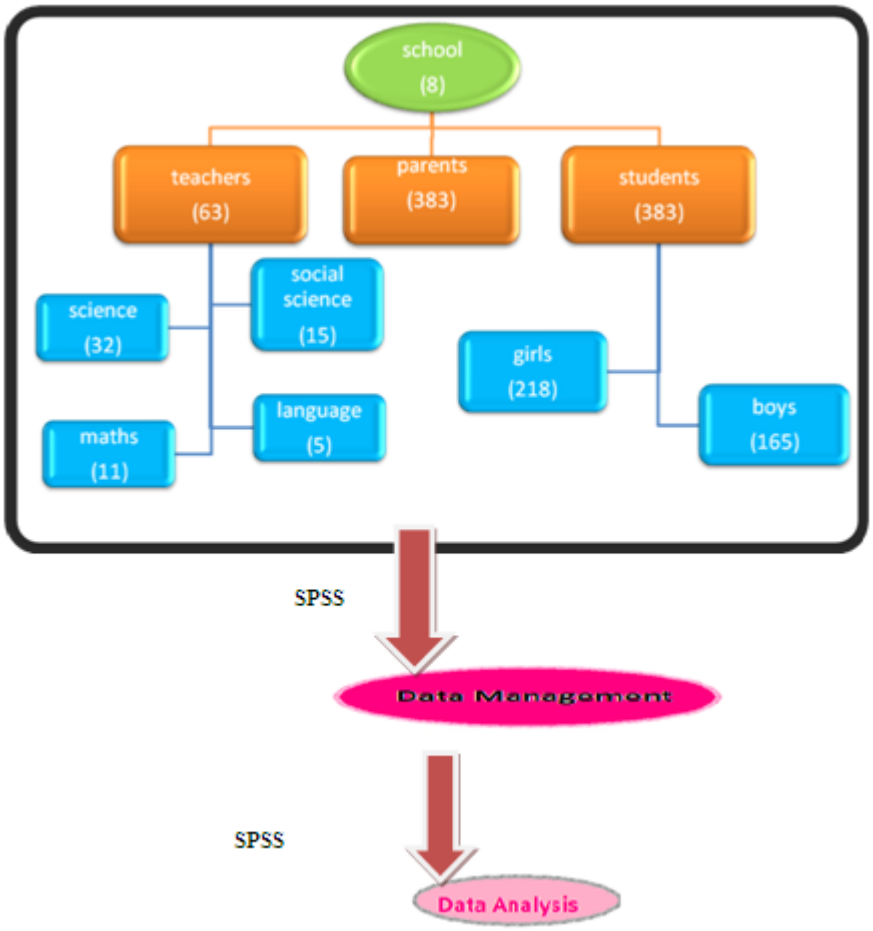


Fig 2 -Diagrammatic representation of Methodology

3. ANALYSIS OF DATA

3.1 School:

Analysis of the data of eight Government CBSE Schools indicate that these schools were about30 to 50 years old, yet all of them have obtained fire safety certificates and earthquake resistance certificates only recently which is an initiative only due to the introduction of disaster education. All these schools which cater to the needs of 1800 students on an average, have procured fire fighting equipments and conduct mock drills for fire ,only after the inclusion of disaster education.

3.2 Assessment of Knowledge Skills of the teachers with regard to basic disaster preparedness.

A range of questions were asked to ascertain the level of disaster preparedness of the teachers. The results for the selected important questions are summarized below:

With regard to the question, as to what one should do when an earthquake occurs when they are on a playground, all of them answered rightly by saying that they will stay in the ground away from the trees and buildings. The same set of teachers responded differently when the question about the right response for a cyclone was put to them. Only 73% of the teachers knew what to do on hearing a cyclone warning. This is very disheartening as the survey was conducted in Chennai, a coastal city highly prone to cyclones.

While more than 80% of the teachers knew that different types of fire extinguisher is needed for tackling fires of different origin and nature, only half of them knew how to use a fire extinguisher.

The survey also focused on the teaching and learning that happened in the classrooms with regard to disasters. When asked if the teachers discuss different types of hazards and dos and don'ts, more than 90% of the teachers responded positively.

The teachers were also asked if the children want to know more than what is in their syllabus and if they are interested in doing mock-drills going beyond mere book learning. The results are very encouraging. Nearly three fourth of the teachers point out that their students want to learn more about disasters and about 22% of them say they want to carry out mock drills. The teachers feel that they are not getting enough training and there is a need for training the teachers in disaster education and mock drills. In addition the teachers felt that there are not sufficient teaching materials available on this subject.

Table 3.2.1 Analysis of Teachers data for Awareness questions

Question	% students responded with correct answers	Association with background variables
Awareness on disasters having warning systems	75% of the teachers were aware for disasters having warning system	Science teachers (78% responded correctly) are better aware on disasters having warning system as compared to Social (67% responded correctly) and Maths (64% responded correctly) teachers. However, this trend is observed in sample and may not be applicable to the population as the chi square value is 0.5 and do not establishes the association.

Table 3.2.2 Analysis of teachers on Preparedness questions

Question	% students responded with correct answers	Association with background variables
Have you undergone first aid training	Nearly two fifth (38%) of the teachers had undergone first aid training	In the sample of teacher, more number of male teachers (56%) has gone for first aid training as compared to female teaches (31%). More number of primary teachers (50%) have undergone first aid training as compared to secondary 36%) and senior secondary teachers (21%). As compared to post graduate teachers (25%) more number of graduate teachers (69%) has undergone first aid training. The p value been 0.01 establishes an association.
Are there fire extinguishers in school	All the teachers reported that there are fire extinguishers in school	

Can same type of fire extinguisher be used for different types of fires	83% of the teachers were aware that same type of fire extinguishers cannot be sued for different types of fires	
Do you know how to use fire extinguisher during an emergency	Half of the teachers (52%) knew how to use fire extinguisher during an emergency	As compared to 40% of the females, 83% of the male teachers reported that they know how to use fire extinguisher during an emergency. The p value of 0.002 also establishes the association.
Do you have buckets of sand placed in prominent places for easy access?	64% of the teachers reported having buckets of sand placed in prominent places for easy access	As compared to 53% of the female teachers, 89% of the male teachers were aware about buckets of sand been placed at prominent places for easy access. The p value of 0.008 also establishes the association.
Do you discuss about dos and don'ts during different types of hazards with your students?	92% of the teachers reported that they discuss dos and don'ts during different types of hazards with student	
Are the children interested in learning about disasters?	86% of the teachers reported that children are interested in learning about disasters	9% of the teachers reported that children are not interest in learning about disasters because content in the syllabus is very less and the subject is usually given as project.
Do the children ask a number of questions while you teach about disasters?	87% of the teachers reported that they children number of questions while teaching about Disasters	Usually the children demand more content on Disaster and mock drills.
Teaching disasters and its dos and don'ts is difficult.	40% of the teachers reported that teaching disasters and its dos and don'ts is difficult	These teachers have expressed that more number of trainings are required and sufficient materials should also be provided. As compared to male teachers (28%), more number of female teachers (44%) reported that teaching disasters and its dos and don'ts is difficult. As compared to post graduate teachers (36%), more number of graduate teachers (50%) reported that teaching disasters and its dos and don'ts is difficult.

Do you think, introduction about disasters and preparedness in the syllabus is very essential	95% of the teachers believe that introduction about Disasters and preparedness in the syllabus is very essential	
Is the content of Disaster Management in syllabus sufficient.	More than three fifth (65%) of the teachers expressed that the content on disaster management is not sufficient	These teachers feel that content in the syllabus should be increased and there should be a separate book introduced. As compared to primary 66%) and secondary teachers (52%), more number of senior secondary teachers (86%) expresses that the content on disaster management in the syllabus is not sufficient.
Is it necessary for Disaster management plans to be made and mock drills conducted in schools.	Most of the teachers (89%) expressed that disaster management plans should be made and mock drills should be conducted in schools	

3.3 Assessment of awareness and preparedness of Students

The responses of the students analyzed on the basis of awareness and preparedness and compared are given in the form of tables.

Table 3.3.1 Analysis of Students on Awareness questions

Question	% students responded with correct answers	Association with background variables
Awareness on hazards that are likely to take place in their area	37% of students were aware of the hazards that are likely to take place in their region	It was observed that higher income groups have better awareness for hazards that are likely to take place in the region. The chi square test having p value of 0.002 also establishes association between the two variables.
Awareness on action taken during an EQ while at home	56% of the students were aware for action to be taken during an EQ while at house	No major significance is established with the background variables. Most of the students (97%) reported been taught about this by teachers (84%) followed by parents (12%) and others 4%.
Awareness on action taken during an EQ while in playground	95% of the students had awareness on action to be taken during EQ while in playground	No major significance is established with the background variables.
Awareness on major tectonic plates on the earth's crust	56% of the students were aware on major tectonic plates on the earth's crust	As compared to BPL students (42% reported correct answers), APL students (63% reported correct answers) were more aware for major tectonic plates on the earth's crust. P value for the chi square is 0.003 which also established the association.

Awareness on hazard classification of India	59% of the students were aware on hazard classification of India	Awareness is better among students from General and OBC (62% respectively reported correct answer) as compared to SC and ST students (44%) respectively. The chi square test having p value of 0.05 also establishes the association between the two variables. Awareness is better among Telugu and Malayalam students (69% and 77% respectively reported correct answer) as compared to Tamil and Hindi speaking students (53% and 51% respectively reported correct answer). The chi square value also establishes an association as the p value is 0.009 which is less than 0.05. Higher the HH income, higher is the awareness of the student. P value of 0.04 establishes the association between the two.
Awareness on the use of Modified Mercalli Scale	37% of students had awareness on the use of Modified Mercalli Scale	Students having mother tongue Malayalam (48% reported correct answer) have better awareness as compared to Tamil and Hindi (31% respectively reported correct answer) speaking students. P value of 0.05 establishes an association between the two variables.
Awareness on disasters having warning systems	61% of the students were aware of disasters having warning systems	No major significance is established with the background variables.
Awareness on action taken on hearing a cyclone warning	73% of students had awareness on action to be taken on hearing a cyclone warning	No major significance is established with the background variables.

Table 3.3.2 Analysis of Students on Preparedness questions

Question	% students responded with correct answers	Association with background variables
Have you undergone first aid training	54% of the students reported having undergone first aid training	No association established with the background variables. 87% of these students were trained by the school either by their teachers or scout camps.
Do you know whom to call during emergency	88% of the students were aware for whom to call during emergency	As compared to class 9th students, class 10th students were more aware for whom to call during emergency. The p value 0.038 establishes the association. As compared to BPL students, APL students have better awareness for whom to call during emergency. The p value 0.05 establishes the association.

Do you discuss about disasters at home	87% of the students reported that they discuss about disasters at home	The association between sex and sharing about disaster at home has been established with the p value 0.006 which is <0.05. As compare to boys (81% reported yes), more number of girl (91% reported yes) are found to discuss about disasters at home. Most of the sharing is been reported with parents, siblings and friends, 67% of the students reported, the remaining share within the family and neighbours.
Fire department number	68% of the students reported correctly for fire department number	The association between sex and knowledge on fire department number has been established with the p valve 0.02 which is < 0.05. More Girls (73% reported correct answer) are aware about fire department number as compared to boys (61% reported correct answer) As compared to General (65% responded correct answer) and SC (62% responded correct answer) children, more number of OBC children (80% responded correct answer) are aware for the fire dept number. The p value 0.003 establishes the association. It has been observed that as the annual income of the HHs increases, awareness on fire dept phone number has increased. The p value 0.003 established the association.
Emergency kit to keep papers	41% of the students reported having emergency kit to keep papers.	As compared to girls (33 % reported having emergency kit), more number of boys (52%) have reporting having emergency kit. The p value 0.00 establishes the association. As compared to 9th class students (35 % reported having emergency kit), more number of class 10th students (46%) have reporting having emergency kit. The p value 0.03 establishes the association.
Phone number of local police station	70% of the students reported having phone number of local police station	As compared to girls (64 % reported knowing phone number of local police station), more number of boys (76%) reported knowing phone number of local police station. The p value 0.01 establishes the association.

Fire extinguishers	89% of the students knew about the place where fire extinguishers are kept in the school	Among the students who reported having knowledge about the place where fire extinguishers are kept, only 46% reported having knowledge about how to use them. No major association established.
Inclusion of Disaster Management inthe syllabus	96% of the students reported that disaster management syllabus inclusion is necessary	These students reported that they feel that knowledge about disaster will help them to be prepared.
Are you happy with what is taught	50% of the students reported been happy with what is taught, but also felt that more detailed study on disaster education is to be included in the syllabus as reported by the remaining 50%	As compared to girls (45% reported being happy with what is taught), more number of boys (56%) were happy with what is taught. The p value of 0.03 establishes the association. Girls are expecting more knowledge content on disasters.
Do you have any difficulties in learning disaster education in school	10% of the students reporting having difficulties in learning disaster education in school since practical approach are not there. 90% of the students reported they had no difficulty in learning the subject since it was very interesting.	No major association established

3.4. Assessment of knowledge skills of Parents based on their Responses:

Of the total parents responded ,88% of them say that they discuss about disasters at home and more than half of them discuss with family friends and neighbors. A vast majority(93.7%)of the parents are aware of what to during an earthquake and 70% during a cyclone. Majority of them (89%) discuss about do and don'ts during a cyclone with their children and friends and neighbors. Most of them (91.4%) reveal that introduction of disaster education in schools has increased the awareness among both children and parents.

Table 3.4.1 Analysis of parents on Awareness questions

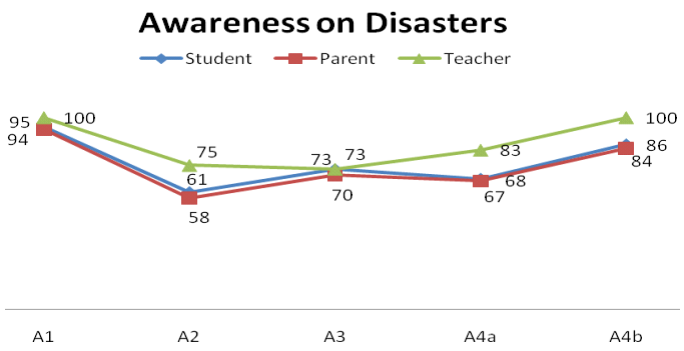
Question	% parents responded with correct answers	Association with background variables
Have the parents heard about Disasters	94% of the parents reported that they have heard about disasters	Main source of knowledge were child's text book, television, newspaper and friends (73%). Television contributes much to the knowledge about disasters, nearly one fifth (19%) of the parents reported TV being the main source of knowledge for disasters.

Awareness on disasters having warning system	Nearly three fifth (58%) of the parents responded with correct answer for Disasters having warning system.	Knowledge of parents definitely has shown contribution for awareness on disasters having warning systems. Fathers who did not had any formal education (44% reported correct answer) have less knowledge for disasters having warning systems as compared to fathers who are graduates and post graduates (58% and 69% respectively reported correct answer. Same trend is also observed for Mothers. Only 44% of mothers having no formal education responded correctly while 72% of mothers having post graduate degrees responded with correct answer. Parents having more annual income are better aware on disasters having warning system. The p value 0.001 which is < 0.05 also establishes the association. 85% of Parent having annual income > 6 lakhs reported correctly as compared to 50% of parents having annual income < 50,000.
Awareness on action taken during an EQ while in playground	94% of the parents responded with correct answer for action to be taken during an EQ while in playground	Mothers with graduate (77% responded correct answer) and post graduate (67% responded correct answer) degrees were better aware on action to be taken during an EQ while in playground as compared to mothers having no formal education (56% responded correct answer). The p value being 0.04 also establishes the association.
Awareness on action taken on hearing a cyclone warning	70% of the parents responded with correct answer for action to be taken on hearing a cyclone warning	As compared to mother with no formal education (56% responded correctly), mothers having completed 12^{th} (73% responded correctly) and above are better aware on action to be taken on hearing a cyclone warning. P value being 0.04 also establishes the association. Parents having higher annual income are better aware on action to be taken on hearing a cyclone warning. 89% of parents having annual income of > 4 lakhs have reported correctly as compared to 54% of parents having annual income of Rs. 50,000. P value being of 0.03 less than 0.05 establishes the association.
Awareness on living in cyclone prone area	Nearly two fifth (38%) of the parents were aware that they are living in a cyclone prone area.	Post graduate fathers (53% reported correctly) have better awareness on living in cyclone prone area as compared to fathers with no formal education (29% reported correctly), SSLC (30% reported correctly) and graduates (33% reported correctly). The p value of 0.005 also establishes the association.

Table 3.4.2 Analysis for parents on Preparedness questions

Question	% parents responded with correct answers	Association with background variables
Fire department number	More than three fifth (67%) of the parents knew the fire dept phone numbers	Parents having more annual income are better aware on fire dept phone numbers. The p value 0.04 which is < 0.05 also establishes the association. 79% of Parent having annual income > 5 lakhs reported correctly as compared to 58% of parents having annual income < 50,000.
Discuss about disasters at home	Most of the parents (88%) reported that they discuss about Disasters at home	Such discussions are reported to be with family, friends and neighbours which indicates that introduction of DM in schools has a ripple effect and reaches the community too.
Emergency kit to keep papers	Among those parents who were aware that they are living in cyclone prone area, half (49%) reported having emergency kits to keep papers	No major trend with background variables
Watch weather bullet in TV.	87% of the parents reported watching weather bullet in TV	Parents with higher annual incomes do engage with watching weather bullet in TV. More than 95% of the parents having annual income > 2 lakhs engage themselves in watching weather bullets in TV as compared to parents with less income (79% of parents with < 50,000 annual income reported watching TV. The p value of 0.009 establishes the association.
Discuss about dos and don'ts during cyclone	Most of the parents (90%) reported discussing dos and don'ts during cyclone	Such discussions are reported with family and friends.
Inclusion of Disaster Management in the syllabus had increased the awareness	Most of the parents (91%) believe that inclusion Disaster Management in the syllabus has increased the awareness.	Knowledge content of children for Disasters has improved, they discuss at home and the overall information on Disasters has increased.

Fig 4- Comparison of the awareness among teachers, students and parents



A1 – Awareness on action taken during EQ wh ile in playground

A2 - Awareness on disasters having warning systems

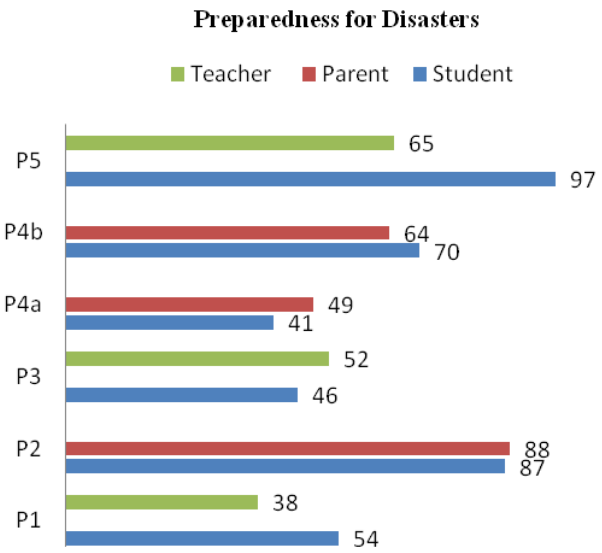
A3 - Awareness on action taken on hearing a cyclone warning

A4a - Awareness for fire

Comparison of awareness and preparedness:

Comparison of the extent of awareness between teachers, parents and students (figure 4) reveal that the teachers are more aware about disasters than parents and students, while students and parents are having almost the same level of awareness. It is very clear from the graph that learning about disasters mainly takes place through the knowledge imparted by schools.

It is indeed very interesting to note the findings from figure 5 given below. Although the awareness about disasters by the teachers is more than students, we find that the students are better prepared to face the situation during a disaster. More than half the students are trained in first aid when compared to only one third of the teachers who are trained in first aid. The percentage of Students knowing how to use the fire extinguisher is equal to that of the teachers (nearly 50%). This indicates that at the time of emergency more students are prepared to tackle the situation. Thus, our main objective of introduction of disaster education has created a positive impact thereby fulfilling our aim. Also nearly all the students want to learn more about disaster education when compared to two third of the teachers. When compared to parents many students are aware of the contact number of the local police station while more number of parents is having emergency kits.



P1 - First aid training

P2 – Discuss about preparedness at home

P3 – Knowledge on using fire extinguishers

p4a – Having an emergency kit

p4b- Having the contact number of the local police station

p5- prepared to learn more on disaster education

Figure 5: Comparison of preparedness among teachers, students and parents

4. DISCUSSION;

Based on the above findings the following are the salient conclusions.

• Safety initiatives in schools have taken place only after the inclusion of disaster education been introduced in the school curriculum.

• Although the teachers are imparting knowledge about disasters to school students they are not well trained to practically face an emergency, since many are not trained how to use a fire extinguisher or trained in first aid.

• Despite little content and lack of importance given to the subject of disaster management in school syllabus, the students are enthusiastic about the subject and they ask many questions, as reported by the teachers and nearly 90% of the teachers answered that the students are very inquisitive and they wanted to know more about disasters and asked questions actively.

• Almost all the teachers feel that disaster management should become part of the regular syllabus as it is a very essential subject of the hour. While nearly 80% felt that more content should be included in the syllabus, 20% even felt that a separate book would be better.

• The knowledge imparted to children has not only provided them a sound understanding of the basics of disaster management but also spread beyond the school campus to the family of the children and thus to the society at large.

• It is also clear that that majority of knowledge is gathered by students, parents and shared with the community are mainly through the school and teachers remain the main source of information and knowledge.

• The fact that the income of parents, caste, religion or sex did not make much of a difference shows that if the teaching in the school is effective, then a culture of disaster preparedness can take place across the society regardless of other differences.

• Students are better prepared to face the situation during a disaster. More than half the students are trained in first aid when compared to only one third of the teachers who are trained in first aid.

• The percentage of Students knowing how to use the fire extinguisher indicates that at the time of emergency more students are prepared to tackle the situation.

• Though introduction of disaster management is proving to be useful, several issues need to be addressed to make it more effective.

1) First the syllabus should contain adequate content and it should be treated as part of the main curriculum. It should be mandatory for the students to learn them from the point of view of knowledge as well as getting practical training on how to tackle emergency situations during a disaster..

2) Second, the teachers should be trained well in both theory and practice of disaster management. Without practical knowledge, merely academic learning will remain insufficient as indicated that more than half the teachers not knowing how to operate a fire extinguisher.

3) Third, policy changes in Education only will bring about desired changes in the attitude towards the subject and thereby create awareness to the society through students.

Initiation to be taken to introduce more content in the syllabus on disaster education, since a natural urge and interest is noticed in learning the subject by all. More training in the form of knowledge, mock drills, first aid and in the preparation of management plans are to be given to the teachers. Involvement of parents and the community, in such planning encourages and enables better preparedness in future.

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