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**ENABLING A CULTURE OF DISASTER PREPAREDNESS: INTRODUCTION  
OF DISASTER MANAGEMENT IN SCHOOL CURRICULUM  
- A COMPARATIVE STUDY OF SCHOOLS IN CHENNAI**



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**ABSTRACT**

**D**isaster 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, preparedness and mitigation as academic subjects aimed at enabling a culture of better disaster

management. It was envisaged that the knowledge imparted to children will not only provide 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. 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 after the study been carried out as a first attempt, based on field work questionnaire survey undertaken in Kendriya Vidyalaya Schools , now a comparative study between State Government, State Government Aided and Private 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. Private schools are more aware and prepared compared to state government schools and state government aided schools.

**KEYWORDS :** *School safety, Disaster management in schools, Culture of disaster preparedness.*

**INTRODUCTION**

Asia-Pacific is one of the most disaster-prone regions. In 2008 natural catastrophes and man-made disasters caused 240,500 fatalities most of which happened in Asia (228,400).<sup>1</sup> 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.<sup>2</sup> 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.<sup>3</sup>

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:<sup>4</sup>

- 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,<sup>5</sup> 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.<sup>6</sup>

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.<sup>7</sup>

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

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.<sup>9</sup>

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 well 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.<sup>10</sup>

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.<sup>11</sup>

As recommended by the HFA12, 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. This study also compares the extent of awareness and preparedness among Teachers, Parents and Students of State Government Schools, State Government Aided Schools and Private Schools in Chennai City, the capital of Tamilnadu. The proposed research will not only try to understand, the impacts and outcomes of introduction of disaster management in different types of 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 different types of schools and also compare its extent, 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.

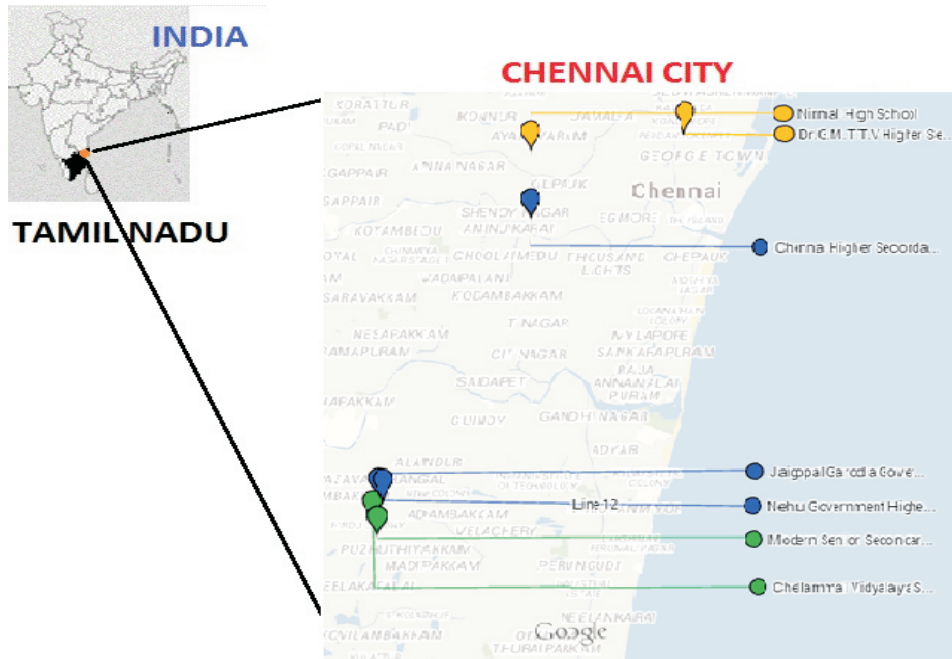
The study area covers 7 schools of which 3 are State Government Schools, 2 State Government Aided Schools and 2 Private Schools , in and around the same locality in Chennai . These schools comprise of students and teachers from different religion ,language, different economic backgrounds and therefore 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

Seven schools were selected randomly, in and around the study area of Central Government Schools selected for previous study 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 3 State Government Schools, 2 State Government Aided Schools and 2 Private Schools in Chennai. Out of these, 65 teachers, 355 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.

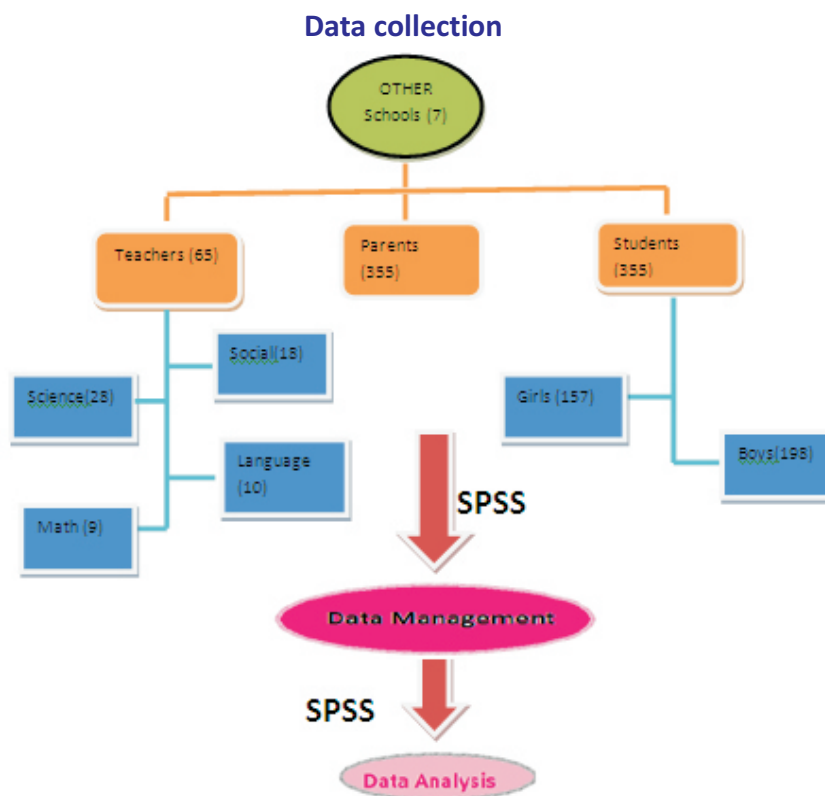


Fig 2 -Diagrammatic representation of Methodology



### Teacher's Profile.

Out of a total of 65 respondents of the questionnaire only very few teachers about 3% were below the age of 30, 25% belonged to age group 30 to 40 years, while nearly a half (54%) belonged to age group 40 – 50 years while the rest 18% were between 50 to 60 years of age. Most of the teachers (94%) were females. 15% of the teachers taught primary sections, 51% of them taught secondary sections while the rest 34% were teaching higher secondary sections. Most of the teachers, about 60% are Post graduates, a quarter (38%) are graduates while the others have some other qualifications. Among the sample coverage of teachers, half (43%) were teaching the subject of pure Science, followed by social science (28%), Math (14%), English (14%) and Hindi (1%).

### Students profile.

Of the total sample of 355 students, 56% of the students were boys while the rest 44% were girls with 48% of the students belonging to class 9th while the rest 53% belonged to class 10th.

### Profile of parents:

During the study, parents of the students contacted were also approached and interviewed. Nearly one tenth of the fathers (9.5%) reported not having formal education, followed by a third (32%) reporting having completed their 12th class, a quarter (18%) were graduates, less than one tenth (8.5%) were post graduates while the rest 33% had done other qualifications like Diplomas, etc. Similar kind of education trend is been observed for mothers also. A tenth (14.4%) reported not having formal education, followed by a quarter (27%) reported having completed their 12th class, less than one fifth (17.5%) were graduates, less than one tenth (7.3%) were post graduates while the rest 34% reporting having academics in other branches like Diplomas, etc.. Most of the mothers were aged between 31 – 40 years (64%) and 22% was in the age group 41 – 50 years.

### 3. Analysis of Data

#### 3.1 School:

Analysis of the data of seven Schools indicate that these schools were about 30 to 50 years old, yet all of them have obtained fire safety certificates only recently which is an initiative only due to the introduction of disaster education but only private schools have got earthquake resistance certificates. Private schools cater to the needs of almost triple the number of students when compared to State government and Government aided schools. Similarly private schools seem to conduct fire drills while the government schools do not. The economical background of the students of Government schools are low when compared to those of private schools.

#### 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, 97% 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 72% 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. Primary teachers were least aware (30% responded correct answer) as compared to secondary (82%) and senior secondary teachers (77%). The p value of 0.005 at 95% confidence level

establishes the association.

Post graduate teachers are more aware (82%) as compared to graduate teachers (60%). The p value of 0.04 establishes the association at 95% confidence level. Accessing the awareness on disasters having warning systems, 91% of the teachers were aware. School wise variation reflects that teachers of SG(State government) and SG aided schools (100% and 90% responded correct answers) are more aware as compared to private schools teachers (77%). The association is found to be significant with p value being 0.03 at 95% confidence level.

Majority of the teachers reported having fire extinguishers in the school. .School wise variation reflects that all teachers of private and SG aided schools (100%) reported having fire extinguishers in the school while only 82% of SG teachers reported the same. The association is found to be significant with p value being 0.02

It is unfortunate that even though 88% of the teachers were aware that same type of fire extinguishers cannot be used for different types of fires, only around two fifth (39%) of the teachers knew how to use fire extinguisher during an emergency. School wise variation reflects that more than half (55% and 53% respectively) of SG aided and private schools know usage of fire extinguishers during an emergency as compared to teachers of SG schools, among which only 18% have reported knowing usage of fire extinguishers during an emergency. The association has been found to be significant with p value being 0.01 at 95% confidence level.

Surprisingly only 46% of teachers of SG school reported having buckets of sand placed in prominent places for easy access as compared to teachers of SG aided and private schools, were more than 90% of the teachers have reported having buckets of sand placed in prominent places for easy access. The p value of 0.00 establishes the association at 95% of confidence level.

Interestingly, most (91%) of the teachers reported that children are interested in learning about disasters. Comparatively less percentage of teachers of SG school (61%) have reported that children asks number of questions about disasters. The percentage of teachers reporting the same is high at SG aided (95%) and private (88%) schools. The p value of 0.009 establishes the association at 95% of confidence level.

99% of the teachers believe that introduction about Disasters and preparedness in the syllabus is very essential and these teachers feel that content in the syllabus should be increased and there should be a separate book introduced.

Surprisingly, 90% of the primary teachers reports that the content on disaster management in the syllabus is sufficient as compared to secondary (21%) and senior secondary (32%) teachers. These teachers feel that content in the syllabus should be increased and there should be a separate book introduced. Most of the teachers (97%) 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 your area	32% of students were awareness on hazards that are likely to take place in the region.	<p>Highest awareness is observed among students of SG aided (51%) followed by Private (40%) and SG (10%). Association is significant with p value 0.00 at 95% confidence level.</p> <p>As compared to 9<sup>th</sup> class students (only 26% responded with correct answer), awareness among 10<sup>th</sup> class students is more as 39% responded with correct answer. The association is found to be significant with p value being 0.01 at 95% confidence level.</p> <p>The association with sex of the students is also found to be significant with p value being 0.04 at 95% confidence level. More % of girls (38%) responded with correct answer as compared to boys (28%). General caste students (44%) are more aware as compared to SC (24%), OBC (31%) and ST (33%) students, the association gets established with p value being 0.02. Students belonging to HHs(Household) having business / trade (49%) or private (42%) occupations or central government (43%) jobs are better aware as compared to students belonging to HHs having wage labouring as occupation. The p value of 0.009 establishes the association.</p> <p>The higher income group children are more aware as compared to low income group children. The p value of 0.00 establishes the association at 95% of confidence level.</p>
Awareness on action taken during an EQ while at home	33% of the students were aware for action to be taken during an EQ while at house.	<p>Highest awareness is observed among students of private school (57%) followed by SG aided (33%) and SG (16%). Association is significant with p value 0.00 at 95% confidence level.</p> <p>Most of the students (97%) reported been taught about this by teachers (84%) followed by parents (12%).</p> <p>Most of the students (87%) reported being taught by teachers (90%) about action to be taken during an EQ while at home.</p>

<p>Awareness on action taken during an EQ while in playground</p>	<p>56% of the students had awareness on action to be taken during EQ while in playground</p>	<p>All students of private school (98%) responded correct answer, followed by SG students (58%) and lastly by SG aided school students (19%). The association gets established with p value being 0.00.</p> <p>Girls were more aware (68%) as compared to boys (46%). The p value of 0.00 establishes the association at 95% of confidence level. Students belonging to General caste displayed more awareness (84%) as compared to OBC (52%) and SC (34%) students. The p value of 0.00 establishes the association. Students belonging to families having wage laboring as occupation have displayed least awareness (27%). The p value of 0.00 establishes the association at 95% of confidence level. As the income increases, students are found to be more aware. The p value of 0.00 establishes the association at 95% of confidence level. Students belonging to APL families are more aware (80%) as compared to students belonging to BPL families (38%). The p value of 0.00 established the association.</p>
<p>Awareness on major tectonic plates on the earth's crust</p>	<p>50% of the students were aware on major tectonic plates on the earth's crust</p>	<p>Students belonging to private school are more aware (70% responded correct answer) as compared to SG (51%) and SG aided (33%). The association is found to be significant with p value being 0.00 at 95% confidence level.</p> <p>9<sup>th</sup> class students are found to be more aware (63% responded correct answer) as compared to class 10<sup>th</sup> students (36%). The association is found to be significant with p value being 0.00 at 95% confidence level. General and ST students (66% respectively) are found to be more aware as compared to OBC (42%) and SC (45%). The association is found to be significant with p value being 0.001 at 95% confidence level.</p> <p>Students belonging to higher income group are more aware as compared to students belonging to low income group. The p value of 0.004 very much establishes the association. Similar kind of association is also been observed for Ration card where students belonging to APL households are found to be more aware (65%) as compared to students belonging to BPL HHs (36%) and the association holds true with p value being 0.00.</p>

<p>Awareness on hazard classification of India</p>	<p>67% of the students were aware on hazard classification of India.</p>	<p>The students belonging to SG aided schools displayed highest awareness (80% responded correct answer) as compared to private (74%) and SG (51%) schools. P value is 0.00 which establishes the association at 95% of confidence level.</p> <p>Students belonging to General caste (80%) are more aware as compared to ST (68%) and SC (54%) students. P value is 0.001 at 95% confidence level which establishes the association.</p> <p>Similar kind of association is also been observed for Ration card where students belonging to APL households are found to be more aware (78%) as compared to students belonging to BPL HHs (61%) and the association holds true with p value being 0.001.</p>
<p>Awareness on reasons for maximum number of death after EQ</p>	<p>64% of students were aware on reason for maximum number of deaths post EQ.</p>	<p>Students of private school are more aware (83%) as compared to students of SG aided (67%) and SG (49%). The association gets established with p value being 0.00 at 95% confidence level.</p> <p>The awareness among boys is significantly higher (81% responded correct answer) as compared to girls (43%). The association gets establishes with p value of 0.00 at 95% of confidence level.</p> <p>Students being aware about living in disaster prone area (77%) were also found to be aware for reasons for maximum number of deaths after EQ. The significant association gets established with p value being 0.01 at 95% of confidence level.</p> <p>Students belonging to families having wage labouring as occupation showed least awareness (53%) as compared to families having business (81%) and private (78%) occupations. The p value is 0.00 and hence the association is significant. Similar association is found with income group, students belonging to higher income groups are found to be more aware are compared to low income groups. The association gets established with p value being 0.01 at 95% confidence level.</p> <p>Students belonging to APL families (73%) are more aware as compared to students belonging to BPL families (58%) and the association gets established with p value being 0.02 at 95% confidence level.</p>

<p>Awareness on reasons for landslides, floods, fires, tsunami</p>	<p>64% of the students were aware for reasons for landslides, floods, fires and tsunami</p>	<p>No school wise variation is observed.</p> <p>No major significance is established with the most of the background variables.</p> <p>Students belonging to APL families have displayed more awareness (77%) as compared to students belonging to BPL families (53%).</p>
<p>Awareness on % of earth vulnerable to EQ in India</p>	<p>27% of the students were aware on percentage of earth vulnerable to EQ in India</p>	<p>Though the awareness on % of earth vulnerable to EQ in India is found to be overall very less (only 27% responded correct answer), however, efforts were made to find out if any significant association is there with the background variables and is the awareness different among different groups under study.</p> <p>Boys were more aware (35%) as compared to girls (17%) and the association gets established with p value being 0.00 at 95% confidence level. Students belonging to OBC families were more aware (38%) as compared to General (24%) and SC (18%) students and the association gets established with p value being 0.003 at 95% confidence level.</p>
<p>Awareness on the use of Richter scale</p>	<p>53% of students had awareness on the use of richter scale</p>	<p>Students of private school (62%) were more aware as compared to students of SG school (42%).</p> <p>Students belonging to General caste (67%) were more aware as compared to OBC (43%) and SC (51%). P value of 0.004 establishes the association. Students belonging to APL families (66%) were more aware as compared to BPL families (45%). P value of 0.00 establishes the association.</p>
<p>Awareness on the use of Modified Mercalli Scale</p>	<p>19% of students had awareness on the use of Modified Mercalli Scale.</p>	<p>Students of private school (45%) were more aware as compared to students of SG school aided (12%) and SG schools (6%).</p> <p>Comparatively students belonging to General caste (35%) were more aware as compared to OBC (15%) and SC (7%). P value of 0.00 establishes an association between the two variables. Students with family occupation in business / trades comparatively more aware. The p value of 0.00 establishes the association. Again, higher the income, more is the awareness among the students. The p value of 0.00 establishes the association. P value of 0.004 establishes the association that students of APL families are more aware as compared to BPL families.</p>

Awareness on disasters having warning systems	58% of the students were aware for disasters having warning systems	<p>As compared to students of SG aided schools (32%), awareness among students of SG (74%) and Private schools (70%) was more. P value of 0.00 establishes the association at 95% of confidence level.</p> <p>Students of 9<sup>th</sup> class were more aware (64%) as compared to 10<sup>th</sup> class students (52%). P value of 0.03 establishes the association. Students belonging to APL families were more aware (66%) as compared to students of BPL families (53%). P value of 0.04 establishes the association.</p>
Awareness on action taken on hearing a cyclone warning	63% of students had awareness on action to be taken on hearing a cyclone warning	<p>Students of private school are more aware (78%) as compared to SG (58%) and SG aided (56%) schools. P value of 0.001 establishes the association at 95% of confidence level.</p> <p>Girls were found to be more aware (71%) as compared to boys (56%). P value of 0.002 establishes the association at 95% of confidence level. Students belonging to general caste displayed highest awareness (78%) as compared to SC (60%) and ST (53%) students. Students belonging to families having wage labouring as occupation have displayed least awareness (51%). The p value of 0.01 establishes the association. Students belonging to APL families (70%) are more aware as compared to students belonging to BPL families (55%). The p value of 0.01 establishes the association.</p>

**Analysis for Students on Preparedness questions**

Question	% students responded with correct answers	Association with background variables
Have you undergone first aid training	58% of the students reported having undergone first aid training. 51% of these students reported getting trained by teachers and equal % (15 – 17%) by others.	<p>Among the different kinds of schools, highest awareness was observed among students of SG school (72% responded correct answer) followed by private (53%) and SG aided schools (46%). The association is significant with p value of 0.00 at 95% confidence level. Private schools have more coaching by experts (58% of students reported), state govt aided schools depends on teachers for coaching (84%) and SG schools also on teachers (48%) and other sources like scouts and guide camps (21%).</p> <p>Boys were more aware (68%) as compared to girls (46%). The association is significant with p value of 0.00 at 95% confidence level.</p>

Do you know whom to call during emergency	76% of the students were aware for whom to call during emergency.	<p>As compared to class 9<sup>th</sup> students (68%), class 10<sup>th</sup> students (85%) were more aware for whom to call during emergency. The p value 0.000 establishes the association.</p> <p>Boys (88%) were more aware as compared to girls (61%). The p value of 0.00 establishes the association.</p> <p>Students of Private and SG aided are more aware as compared to SG schools. The p value of 0.00 establishes the association.</p>
Discuss about disasters at home	70% of the students reported that they discuss about disasters at home	<p>82% of students of private school reported discussing disasters at home as compared to other schools (SG – 71% SG aided – 60% students reported). The association is significant with p value of 0.002 at 95% confidence level.</p> <p>The association between caste and sharing about disaster at home has been established with the p value 0.01 which is &lt;0.05. As compare to SC (60% reported yes), more number of students of general caste (79% reported yes) are found to discuss about disasters at home.</p> <p>Most of the sharing is with parents, friends and neighbours (71%).</p>
Fire department number	100% of the students reported correctly for fire department number	
Police department number	100% of the students were aware for police department phone number	



<p>Emergency kit to keep papers</p>	<p>32% of the students reported having emergency kit to keep papers.</p>	<p>Students of private school (48%) displayed highest awareness as compared to SG (24%) and SG aided (28%). The p value of 0.00 establishes the association at 95% confidence level.</p> <p>Boys (41%) are more aware as compared to girls (22%). The association gets established with p value of 0.00 at 95% of confidence level.</p> <p>Students of general caste (48%) were more aware compared to SC and OBC (25% respectively). The p value of 0.00 establishes the association at 95% confidence level.</p> <p>Students have family occupation of wage labouring were least aware (22%). The p value of 0.001 establishes the association.</p> <p>As the income increases, the students are found to be more aware. The p value of 0.00 establishes the association.</p> <p>APL students are more aware (42%) as compared to BPL (27%) students. The p value of 0.001 establishes the association.</p>
<p>Phone number of local police station</p>	<p>61% of the students reported having phone number of local police station</p>	<p>Students of private schools (77%) are more aware as compared to SG aided (60%) and SG (51%) schools. the p value of 0.00 establishes the association at 95% confidence level.</p> <p>Boys are more aware (77%) as compared to girls (40%). The p value of 0.00 establishes the association.</p> <p>Students of General caste (69%) and SC (66%) are more aware as compared to OBC students (51%). The p value of 0.01 establishes the association.</p> <p>Students having family occupation in wage labouring are least aware (47%). The p value of 0.001 establishes the association at 95% confidence level.</p> <p>As the annual income increases, awareness among the students has found to be increased. The p value of 0.002 establishes the association at 95% of confidence level.</p>

Fire extinguishers	81% of the students knew about the place where fire extinguishers are kept in the school	Though the over all awareness has found to be high among the students, however, school wise comparison reflects that highest aware for fire extinguishers is among the students of private school (92% reported) as compared to other schools.  Among the students who reported having knowledge about the place where the fire extinguishers are kept in the school, 77% knew how to operate the fire extinguishers.  No major trend is observed with background variables.
Inclusion of Disaster Management in the syllabus	91% of the students reported that disaster management syllabus inclusion is necessary	Majority of the students reported that inclusion of disasters management in the syllabus is necessary. Majority of these students (96%) reflected that knowledge about disasters helps them to get prepared against any such disasters.
Are you happy with what is taught	21% of the students reported been happy with what is taught	No much school wise variation is observed.  Since majority of the students are not happy with what is taught to them about disasters, it is very difficult to find out the association with other variables. Here we can assume that across class, sex, different family backgrounds, most students are not happy with what is taught to them. Most of the students expect more detailed study about disasters.
Do you have any difficulties in learning disaster education in school	16% of the students reporting having difficulties in learning disaster education in school	Since rare number of students have reported having difficulty in learning disaster education, no much variation across class, sex and family background can be reported.

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

Awareness about disasters is observed to be more among the parents of private school as compared to other state government schools. The association has been established with p value being 0.00 at 95% of confidence level.

As reported by parents of State government aided and state government schools, TV is the main source of knowledge for disasters (55% and 46% respectively reported) while in case of parents of private schools, maximum (73%) reported being connected with children textbook, TV and friends for knowledge on disasters. Three fifth (61%) of the parents were aware for disasters having warning system. Awareness about disasters having warning system is observed to be more among the parents of private school as compared to other state government schools. The association has been established with p value being 0.00 at 95% of confidence level.

Astonishingly only quarter (23%) of the parents were aware that they are living in a cyclone prone area with awareness on action to be taken on hearing a cyclone warning is observed to be more

among the parents of private school as compared to other state government schools. The association has been established with p value being 0.00 at 95% of confidence level.

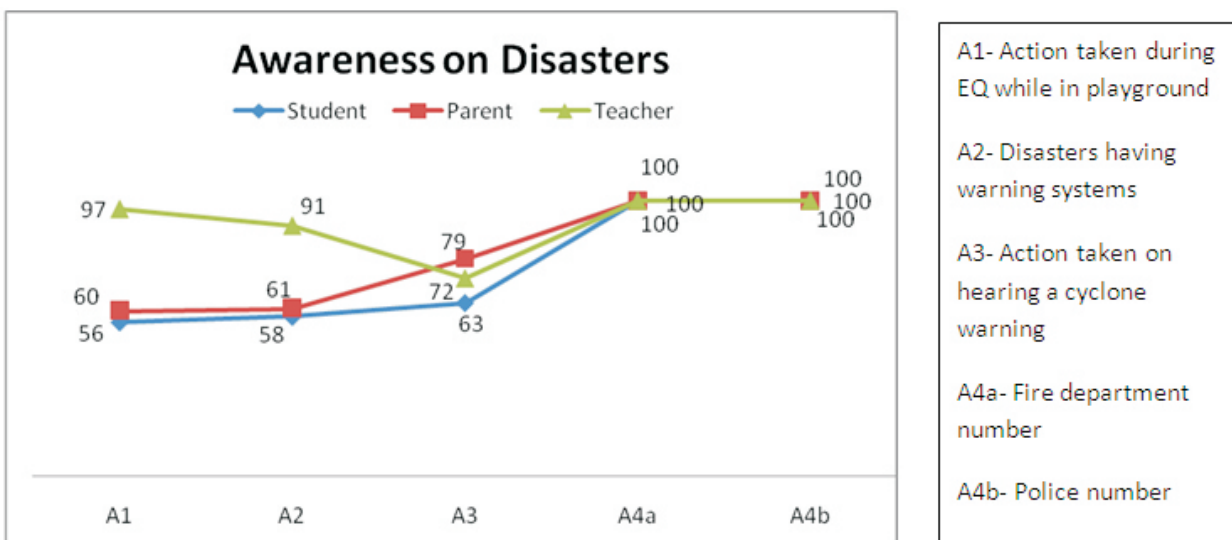
Most of the parents of private schools (93%) followed by State Government Aided (88%) and State Government (68%) reported being aware for whom to call during emergency. Parents of private schools are more aware as compared to other schools; the association gets established with p value being 0.00.

Variation among the schools reflects that 84% of parents of private schools reflected discussing about disasters at home followed by State Government aided (62%) and State Government (61%). This association is found to be significant with p value being 0.00 .84% of the parents believe that inclusion of Disaster Management in the syllabus has increased the awareness.

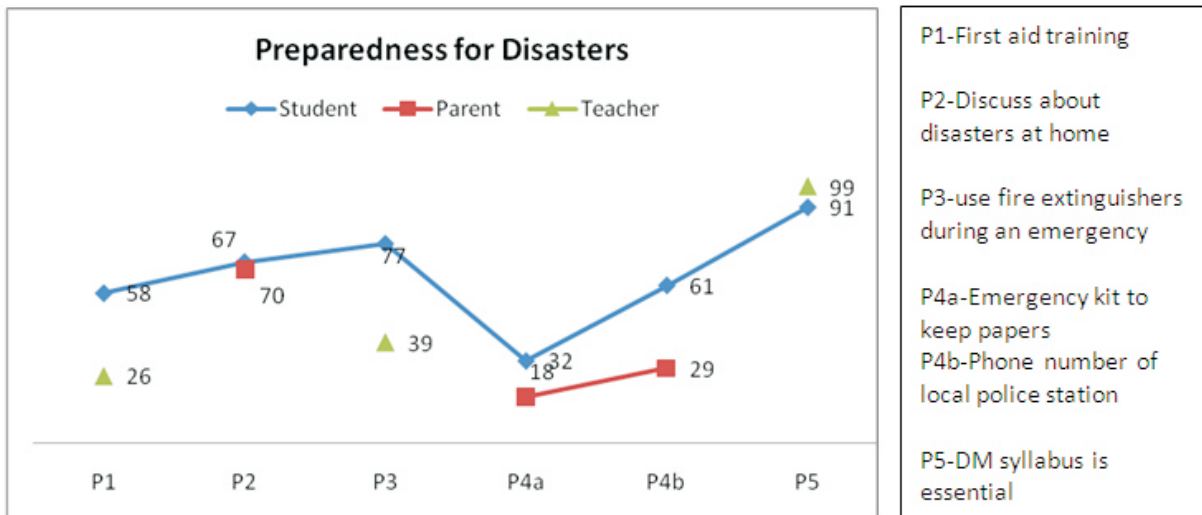
**3.5 Comparison of awareness and preparedness:**

Comparison of the extent of awareness between teachers, parents and students (figure 3) reveal that the teachers are more aware about disasters than students , while all the teachers, students and parents are aware of the phone numbers of police and fire department. It is very clear from the graph that learning about disasters mainly takes place through the knowledge imparted by schools.

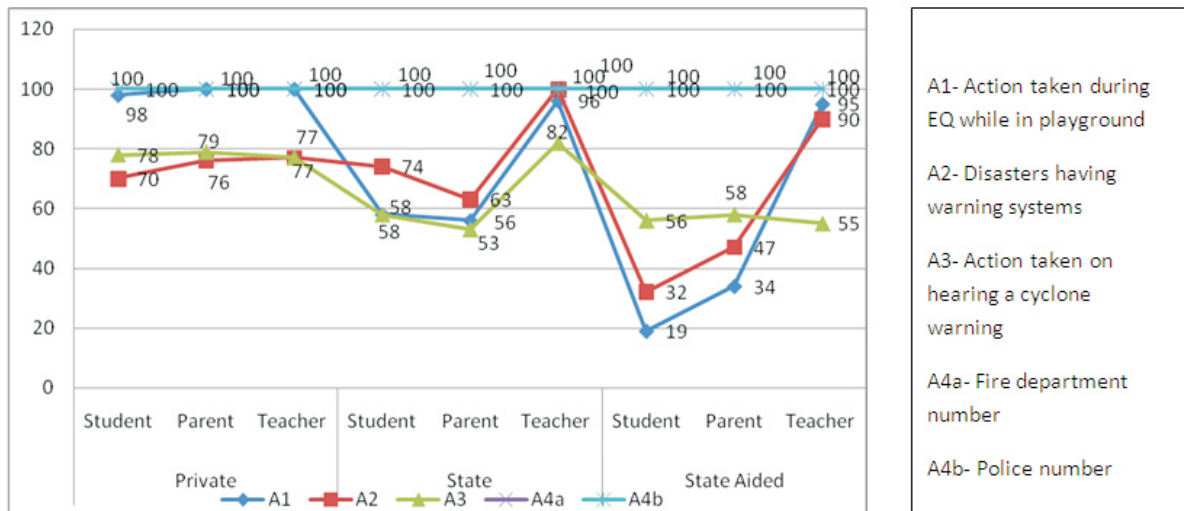
It is indeed very interesting to note the findings from figure 4 given below. Although the awareness about disasters by the teachers is more than students, we find that the students are better prepared to face the situation during a disaster. More than half the students (58%) are trained in first aid when compared to less than one third(26%) of the teachers who are trained in first aid. More than three fourth of Students know how to use the fire extinguisher is (77%) compared to just about one third of the teachers (39%). 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 and teachers want to learn more about disaster education. Unfortunately most students and parents do not have emergency kits and are not aware of the local police number.



**Fig 3: Comparison of Awareness Teachers, Parents and Students**



**Fig 4: Comparison of Preparedness of Students, Teachers and Parents**



**Fig 5 : Comparison of awareness of Students, Parents and Teachers of different types of schools.**

Careful examination of fig.5 highlights that private school teachers, parents and students are more aware about disasters and what to do during earth quakes and cyclone. In state aided schools students are least aware when compared to state and private school students.

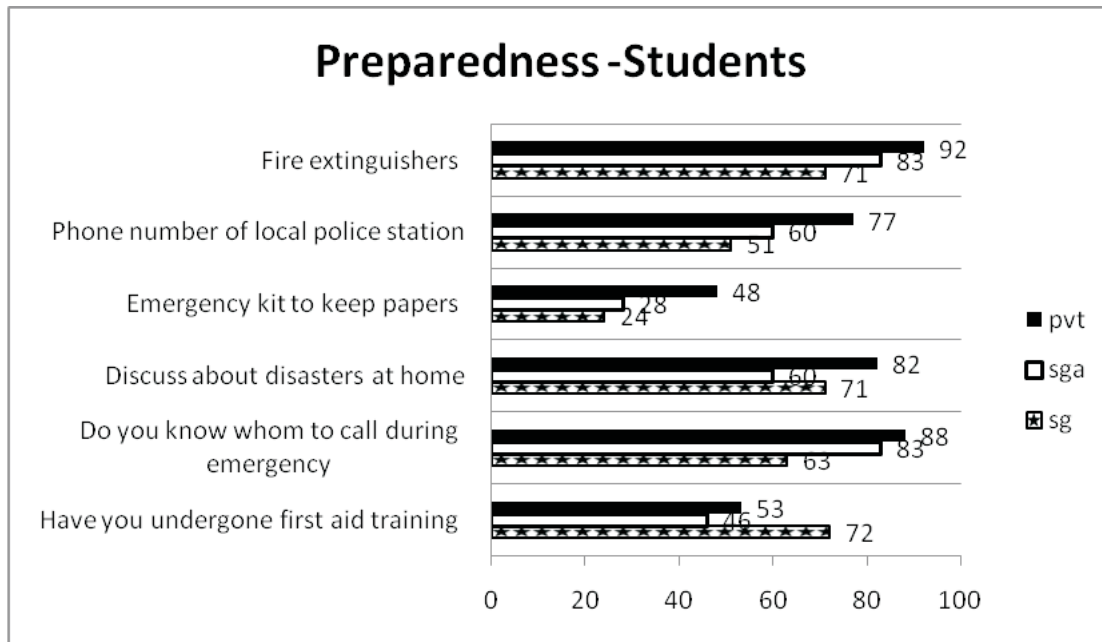


Figure 6: Comparison of preparedness among students

Figure 6 reveals that comparatively the private school students are better prepared than state government and state government aided schools.

**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 79% 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 with nearly 35% felt that more content should be included in the syllabus or as a separate subject.
- 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 fourth 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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