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EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING DISASTER PREPAREDNESS AND MITIGATION AMONG PU COLLEGE STUDENTS AT SELECTED COLLEGES, BANGALORE

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Abstract

A disaster is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. The present study is aimed to assess the effectiveness of structured teaching programme on knowledge regarding Disaster preparedness and mitigation among PU college students at selected colleges, Bangalore. The study involved an evaluative approach with One group pre test – post test (Pre- experimental) research design. 50 samples were selected by using purposive sampling technique. A self administered structured knowledge questionnaire was used to collect the data. The result of the study shows that, most of the subjects 20 (40%) belongs to the age of 17 years and 29 (58%) were female. Majority of the subjects 47(94%) knows English, Hindi, Kannada, 34(68%) subjects got source of information through mass media, 50(100%) subjects had no training. The overall findings of the study clearly showed that the Structured Teaching Programme was effective in improving the knowledge of PU college students regarding Disaster preparedness and mitigation.

Keywords: *Pre experimental research design, Self-administered structured knowledge questionnaire, Disaster preparedness, structured teaching programme, PU college students*

INTRODUCTION

"A great calamity is as old as the trilobites an hour after it has happened"

- Oliver Wendell Holmes

"Disaster is a natural or man-made event that negatively affects life, property, livelihood or industry often resulting in permanent changes to human societies, ecosystems and environment." Disasters are the events that cause suffering, deprivation, hardship and even death, as a result of direct injury, disease, interruption of commerce and business, and the partial or total destruction of critical infrastructure such as homes, hospitals, and other buildings, roads, bridges, power lines, etc. 1

The term disaster owes its origin to the French word DESASTRE, where DES means bad or evil and ASTRE means star – combined it implies "Bad or Evil Star." Generally, disasters are of two types – Natural and Manmade. Natural disasters are flood, cyclone, drought, earth quake, cold wave, thunderstorms, heat waves, mud slides, volcanoes, Tsunamis and storm. Man-made disaster includes epidemic, deforestation, pollution due to prawn cultivation, chemical pollution, wars, road /train accidents, riots, food poisoning, industrial disaster/ crisis and environmental pollution.2

The damage caused by disasters is immeasurable and varies with the geographical location, climate and the type of the earth surface/degree of vulnerability. This influences the mental, socio-economic, political and cultural state of the affected area. It completely disrupts the normal day to day life, like food, shelter,

health, etc.3

Disaster management (or emergency management) is the discipline of dealing with and avoiding both natural and manmade disasters. It involves preparedness training by private citizens response and recovery in order to lessen the impact of disasters.4

Mitigation activities eliminate or reduce the probability of disaster occurrence, or reduce the effects of unavoidable disasters. Mitigation measures include building codes; vulnerability analyses updates; zoning and land use management; building use regulations and safety codes; preventive health care; and public education. Professional certifications such as Certified Emergency Manager (CEM) and Certified Business Continuity Professional (CBCP) are becoming more common as the need for high professional standards is recognized by the emergency management community. Professional emergency management organizations allow for professional networking by professionals in this field and sharing of information related to emergency management.5

The goal of emergency preparedness programs is to achieve a satisfactory level of readiness to respond to any emergency situation through programs that strengthen the technical and managerial capacity of governments, organizations, and communities. These measures can be described as logistical readiness to deal with disasters and can be enhanced by having response mechanisms and procedures, rehearsals, developing long- term and short-term strategies, public education and building early warning systems. Preparedness can also take the form of ensuring the strategic reserves of food, equipment, water, medicines and other essentials maintained in cases of national or local catastrophes.6

PREVALENCE

According to statistics released by the National Crime Records Bureau (NCRB), 28 states together accounted for 1,36,771 deaths and the seven union territories for the remaining. Tamil Nadu tops the list of with 16,175 deaths in 67,757 accidents, followed by Uttar Pradesh with 15,109 deaths in 24,478 accidents. Andhra Pradesh is third with 14,966 deaths in 39,344 accidents and Maharashtra fourth with 13,936 deaths in 45,247 accidents. The capital city of Delhi accounts for 1,866 deaths in 6,937 accidents.4
Almost 85% of the country is vulnerable to single or multiple disasters. Of the 35 states and union territories in the country, 27 are disaster prone. The multi hazard map of India depicts that 229 districts of India are prone to multiple hazards, West Bengal for example is prone to four types of hazards. Floods, droughts, earthquakes, cyclones, landslides and avalanches have taken a heavy toll of lives and have caused enormous damage to property. Tsunami is the latest addition to India's woes of natural disasters.5
Government of India, ministry of home affairs and United Nations development programme has signed an agreement in august 2002 for implementation of "disaster risk management" programme to reduce the vulnerability of the communities to natural disasters, in identified multi hazard disaster prone areas. The programme has been divided in to two phases over a period of six years. Phase-1 [2002-2004] would provide support to carry out the activities in 28 selected districts in the states of Bihar, Gujarat and Orissa. In Phase-2 [2003-2007], the programme would cover 141 districts such as Assam, Meghalaya, Sikkim, West Bengal, Uttaranchal, U.P, Delhi, Maharashtra, Tamilnadu, Manipur, Mizoram, Tripura, Arunachal Pradesh and Nagaland. 7

The role of emergency management in India falls to National Disaster Management Authority of India, a government agency subordinate to the Ministry of Home Affairs. In recent years there has been a shift in emphasis from response and recovery to strategic risk management and reduction and from a government-centered approach to decentralized community participation. The Ministry of Science and

Technology supports an internal agency that facilitates research by bringing the academic knowledge and expertise of earth scientists to emergency management.8

The recovery phase starts after the immediate threat to human life has subsided. The immediate goal of the recovery phase is to bring the affected area back to some degree of normalcy. The most extreme home confinement scenarios include war, famine and severe epidemics and may last a year or more. Then recovery will take place inside the home. Planners for these events usually buy bulk foods and appropriate storage and preparation equipment and eat the food as part of normal life.9

NEED FOR THE STUDY

"Disaster mitigation... increases the self reliance of people who are at risk – in other words, it is empowering"

- Ian Davis

The world today is exposed to new and various kinds of dangers due to complex changes in climates and social structures. In recent years, we have witnessed some of the worst calamities, such as the 9.11 terrorist attack of the US World Trade Centre in 2001, huge typhoon disasters in Korea in 2002 and 2003, the tsunami that swept across Southeast Asia in 2004, Hurricane Katrina that wreaked havoc in the United States in 2005, the new type of influenza in 2009 and Hurricane Sandy hitting the US east coast in late October 2012.10

The Brahmanbaria tornado 2013 was a deadly tornado that took place in the Brahmanbaria District of Bangladesh on March 22, 2013. The tornado struck 20 villages with a diameter of 8 km travelling at a speed of 70 km per hour; killed 31 people and injured approximately 500 when the tornado moved through the villages of Ramrail, Basudeb, Chinair, Sultanpur union of Sadar Upazila and North Akhaura union of Akhaura upazila in Brahmanbaria district.11

In 2011, 332 natural disasters were registered, less than the average annual disaster frequency observed from 2001 to 2010 (384). However, the human and economic impacts of the disasters in 2011 were massive. Natural disasters killed a total of 30,773 people and caused 244.7 million victims worldwide. Economic damages from natural disasters were the highest ever registered, with an estimated US$ 366.1 billion.12

The disaster that made most victims in 2011 was the flood that affected China in June, causing 67.9 million victims. Furthermore, China was affected by a drought from January to May (35.0 million victims), a storm in April (22.0 million victims) and another flood in September (20.0 million victims), further contributing to a total of 159.3 million victims in China in 2011, a figure representing 65.1% of global reported disaster victims. Droughts and consecutive famines made many victims in Ethiopia (4.8 million), Kenya (4.3 million) and Somalia (4.0 million). When considering the population size of the country, 42.9% of Somalia‟s population was made victim of natural disasters in 2011, mostly due to drought.13

In 2011, 36 geophysical disasters (earthquakes/tsunamis, volcanoes and dry mass movements) were registered, representing a share of 10.8% of total disaster occurrence. Geophysical disasters accounted for 68.1% of total reported deaths from natural disasters in 2011, compared to a share of 45.5% per year on average for 2001-2010. They caused 1.8 million victims, less than the annual average number of victims from 2001 to 2010 (8.9 million). Geophysical disasters took a share of 62.9% of total damages caused by natural disasters in 2011, compared to a share of 20.0% per year. on average from 2001 to 2010. In absolute terms, damages increased from an annual average of US$ 24.1 billion for 2001-2010 to US$ 230.3 billion in 2011.14

Climatological disasters (extreme temperatures, droughts and wildfires) took in 2011 an 11.7% share of total disaster occurrence, comparable with a share of 12.9% per year on average for 2001-2010. Out of the 39 climatological disasters, 17 were droughts, 15 extreme temperatures and 7 wildfires. Climatological disasters took the second-largest share of total disaster victims in 2011 (64.6 million or 26.4% of total disaster victims), as was also the case for the period 2001-2010. The reported damages in 2011 increased by 56.3% compared to the 2001-2010 annual average damages from these disasters. 15

The 2011 Tohoku earthquake, the Great East Japan Earthquake that occurred on 11 March 2011, approximately 70 kilometres east of the Oshika Peninsula of Tohoku. It was the most powerful known earthquake ever to have hit Japan and one of the five most powerful earthquakes in the world since modern record-keeping began in 1900. The earthquake triggered powerful tsunami waves that reached heights of up to 40.5 metres (133 ft) in Miyako in Japan travelled up to 10 km (6 mi) in Inland. On 12 September 2012, a Japanese National Police Agency report confirmed 15,878 deaths, 6,126 injured, and 2,713 people missing across twenty areas well as 129,225 buildings totally collapsed, with a further 254,204 buildings 'half collapsed', and another 691,766 buildings partially damaged. 16
In early May 2008, Cyclone Nargis (CN) tore across the southern coastal regions of Myanmar, pushing a tidal surge through villages and rice paddies. Almost 12 foot wall of Water and wind speed of over 200 km/hr killed tens of thousands of people and left hundreds of thousands homeless and vulnerable to injury and disease. Out of 7.35 million living in the affected townships of Labutta, Bogale, Pyinsalu, Yangon, and many more, approximately 2.4 million were affected. Overall, >50 townships were affected by this most devastating cyclone. 17

Disasters are unstoppable natural and anthropogenic impacts which can be mitigated by suitable management options. India is seventh largest country in the world and is highly prone to natural and anthropogenic disasters. Role of youth on disaster management are “Change the self that talk more than work.” Make people aware on the cause and result of natural disaster and explain the tips that how can we save our environment from disaster. Start campaign from schools and include disaster management in the school curriculum, give rescue training for youth, conduct Media program to aware people, maintain Youth unity for many programs related to disaster management.18

The investigator identified that the PU College students are the ideal group to work on disaster management because they are young and energetic to save the environment from disasters. By creating awareness among them by a structured teaching programme on disaster preparedness and mitigation, we can prepare as rescue team members to safeguard the life of people.
Statement of the Problem

Effectiveness of Structured Teaching Programme on Knowledge regarding Disaster Preparedness and Mitigation among PU College Students at selected colleges, Bangalore

OBJECTIVES OF THE STUDY

- To assess the knowledge of PU college students regarding disaster preparedness and mitigation in terms of pre-test knowledge scores.
- To develop and administer structured teaching programme on disaster preparedness and mitigation among PU college students.
- To assess the effectiveness of structured teaching programme by comparing pre and post-test knowledge scores.
- To find the association between pre-test knowledge scores with selected demographic variables.

HYPOTHESIS OF THE STUDY

- **H1:** There will be significant difference between pre-test and post-test Knowledge scores of PU college students regarding disaster preparedness and mitigation.
- **H2:** There will be significant association between pre-test knowledge scores with selected demographic variables.

METHODOLOGY

The conceptual frame work for this study was derived from the General System Theory by Ludwig Von Bertalanffy (1968). The study involved an evaluative approach with One group pre test – post test (Pre-experimental) research design. 50 samples were selected by using purposive sampling technique. The setting of the study consists of 50 PU college students, Bangalore. A self administered structured knowledge questionnaire was used to collect the data which consists of two parts, (Part I consists of 5 demographic variables and Part II consists of 42 knowledge questions). The results were described by using descriptive and inferential statistics.

RESULTS

The results of the study were as follows

Table 1: Demographic data of PU college students

N = 50

Characteristics		Frequency	Percentage (%)
Frequency and Percentage Distribution of participants by Age in years			
Age in years	16 years	18	36
	17 years	20	40
	18 years	12	24
Frequency and percentage distribution of participants by Gender			
Gender	Male	21	42
	Female	29	58
Frequency and Percentage Distribution of participants by Languages known			
Languages known	English	0	0
	Hindi	0	0
	Kannada	3	6
	All of the above	47	94
Frequency and percentage distribution of participants by Source of information			
Source of Information	Mass media	34	68
	Friends and Relatives	6	12
	Health personnel	7	14
	Others	3	6
Frequency and percentage distribution of participants by Source of information			

Source of Information	Mass media	34	68
	Friends and Relatives	6	12
	Health personnel	7	14
	Others	3	6
Frequency and percentage distribution of participants by Training			
Training	No	50	100
	Yes	0	0
Total		**50**	**100**

Table 2: Knowledge score of PU college students regarding disaster preparedness and mitigation in terms of pretest and post test.

Table 2a: Area wise Mean, Mean % and Standard Deviation of Pre-test Knowledge Score

N = 50

Sl. No	Area wise	No. of items	Mean	Mean%	S.D
1	General information regarding disaster	29	12.9000	44.48	2.99
2	Disaster preparedness	9	3.3000	36.67	1.32
3	Disaster mitigation	4	1.1600	29.00	0.95
Overall knowledge score		**42**	**17.3600**	**41.33**	**3.89**

Table 2b: Area wise Mean, Mean % and Standard Deviation for the Post Test Knowledge Score

N=50

Sl. No	Area wise	No. of items	Mean	Mean%	S.D
1	General information regarding disaster	29	21.1600	72.97	3.36
2	Disaster preparedness	9	6.4600	71.78	1.22
3	Disaster mitigation	4	3.0800	77.00	0.99
O overall knowledge score		**42**	**30.7000**	**73.10**	**4.53**

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Table 2c: Distribution of level of Knowledge Regarding Disaster Preparedness and Mitigation

N= 50

Knowledge	Pre test		Post test	
	Frequency	%	Frequency	%
Inadequate knowledge	42	84	0	0
Moderately adequate knowledge	8	16	29	58
Adequate knowledge	0	0	21	42
Total	**50**	**100.0**	**50**	**100.0**

Inadequate – less than 50%, moderately adequate – 50-75%, adequate - 75-100%

The result of the study shows that, most of the subjects 20 (40%) belongs to the age of 17 years and 29 (58%) were female. Majority of the subjects 47(94%) knows English, Hindi, Kannada, 34(68%) subjects got source of information through mass media, 50(100%) subjects had no training. The overall mean difference between pre-test (17.36) and post- test score (30.70) was 13.34 with 't' value of 39.18 was found significant at the level of P <0.05. Hence the research hypothesis H1 is accepted. This indicates that STP was effective in increasing the knowledge of PU college students regarding Disaster preparedness and mitigation. From this study it is evident that the obtained chi square value of age (3.95), Gender (2.05), Languages known (0.35), Source of information (5.07) was lesser than the table value at the level of P< 0.05 level of significance. The result shows that there is a no significant association between pre- test knowledge score with selected demographic variables. Hence H2 is rejected.

DISCUSSION

The findings of the study were discussed under the following headings

Section I: Demographic characteristics of The Oxford PU college students.
Section II: Knowledge of PU college students regarding Disaster preparedness and mitigation in terms of pre test and post test Knowledge scores.
Section III: Effectiveness of STP on Disaster preparedness and mitigation.
Section IV: Association of pre-test knowledge scores with selected Demographic variables.
Section V: Testing of hypothesis.

Section I*:* Demographic characteristics of The Oxford PU college students.

In this study most of the subjects 20(40%) belongs to the age of 17 years and 29(58%) were females. Majority of the subjects 47(94%) knows Kannada, English, Hindi languages and 50(100%) of the subjects had not undergone training. With regards to source of information regarding disaster preparedness and mitigation, majority of the subjects 34(68%) got information through the mass media. This study is supported by a study conducted by Saundra K. Schneider, Brenda D. Phillips, Shannon Doocy, Amy Daniels to assess knowledge of PU college students regarding disaster preparedness and mitigation. In the supportive study data were collected from 60 students aged 16-18 , and 54% were females.62

Section II: Knowledge of PU college students regarding Disaster preparedness and mitigation in terms of pre test and post test.

The overall mean knowledge score obtained by the participants in pre test was 17.36 with standard

deviation 3.89 and the overall mean knowledge score obtained by the participants in post test was 30.70 with standard deviation 4.53. The findings of the present study are consistent with the findings of Jonathan P. Guevarraa, Caridad. A. Ancheta, Jason .O, A. Hince to assess current level of understanding among PU college students regarding Disaster preparedness and mitigation. In that study the overall mean knowledge score obtained by the participants in the pre test was 19.58 with standard deviation of 4.23 and the overall mean knowledge score obtained by the participants in post test was 41.25 with standard deviation of 5.84.63

Section III : Effectiveness of STP on Disaster preparedness and mitigation.

The overall mean knowledge score obtained by the participants in pre test was 17.36 with standard deviation 3.89 and the overall mean knowledge score obtained by the participants in post test was 30.70 with standard deviation 4.53. The enhancement of mean knowledge score of overall knowledge was 13.34, the 't' value of 39.18 was found significant at $p< 0.05$ level. It is evident that developed STP was effective in increasing the knowledge of subjects. Similar study was carried out by Shanmugha Sundaram S were the mean value of experimental group was48.69 with the standard deviation of 17.41 where as in the control group the mean value was only 5.36 with the standard deviation of 11.94. After STP the paired 't' value was17.69 at the level of $P<0.05$ which is highly significant.

Section IV: Association of Pre test Knowledge Score with selected Demographic Variables.

From the study findings, it is evident that the obtained chi square value of age (3.95), gender (2.053), languages known (0.355), source of information (5.07) were lesser than the table value at $p<0.05$ level of significance. Hence it is found that there is a no significant association of pre test knowledge score with the selected demographic variables.

Section V : Testing of Hypothesis.

The present study reveals that overall mean knowledge score obtained by the participants in pre-test was 17.36 with standard deviation of 3.89 and the overall mean knowledge score obtained by the participants in post-test was 30.70 with standard deviation of 4.53. The improvement of mean score of overall knowledge was 13.34, the 't' value of 39.187 was found significant at $P<0.05$ level. It is evidenced that developed STP was effective in increasing the knowledge of participants. Hence the research hypothesis stated that there will be significant difference between the pre and post test knowledge score among PU college students were accepted.

The obtained chi-square value of age (3.95), gender (2.053), languages known (0.355), source of information regarding disaster preparedness and mitigation (5.07) were lesser than the table value at the level of $P<0.05$ level of significance. So it is found that there is no association of the pre-test knowledge scores with selected demographic variables. Hence the hypothesis stated that there will be significant association between the pre test knowledge score with selected demographic variables were rejected.

CONCLUSION

The conclusion drawn from the study includes; During pre test most of the participants showed inadequate knowledge regarding Disaster preparedness and mitigation which is indicated by overall mean percentage of 41.33% and in the post test scores maximum number of participants gained moderate and adequate knowledge as evidenced by the overall mean percentage of 73.10%. Hence the above findings indicated that the structured teaching programme was effective in increasing the knowledge of the subjects regarding Disaster preparedness and mitigation and it was found to be appropriate, effective and can motivate the samples to enhance their knowledge and practice that in their daily lives.

SUMMARY

A disaster is a result from the combination of hazard, vulnerability and insufficient capacity or measures to reduce the potential chances of risk. A disaster happens when a hazard impacts on the vulnerable population and causes damage, casualties and disruption. The overall findings of the study clearly showed that the Structured Teaching Programme was effective in improving the knowledge of PU college students regarding Disaster preparedness and mitigation.

LIMITATIONS OF THE STUDY

1. The present study was limited to PU college students between the age group of 16-18 years at The Oxford PU College, Bangalore.
2. There can be a threat to the internal validity because the study is not used a control group.

RECOMMENDATIONS

Based on the findings of the study following recommendations were made

1. A similar study can be replicated on a larger sample for wider generalization.
2. Comparative study can be done on rural and urban population.
3. A similar study can be conducted by using different modules like pamphlet/ booklet or SIM.

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