Nanotechnology Perceptions
ISSN 1660-6795
www.nano-ntp.com

"A Quasi Experimental Study To Assess The Effectiveness Of Educational Package On Knowledge Regarding Disaster Preparedness Among High School Students At Adityanath Jha Inter College Rudrapur, Uttarakhand."

Kalplata Singh[1], Sanabam Linthoingambi Devi [2]

Department of Nursing, Bareilly International University, Uttar Pradesh 243006, INDIA E-mail: kalplatasingh@gmail.com

Disasters are unpredictable and can only be dealt by effective disaster management programs. Students can prove to be useful workforce in disaster situation. College students need to know basic plan of action to be carried in an emergency. It is not possible to prevent disasters, but it is possible to be prepared. Students can be made aware regarding the impacts of disasters through formal and informal education. The practices regarding disaster preparedness training and performance of drills are largely negative and sincere work needs to be done in this direction.

A disaster is any unnatural or artificial occurrence that has a detrimental impact on people, things, livelihoods, or industries. These events frequently cause long-lasting disruptions to human civilizations, the environment, and ecosystems. Disasters are very rare events that result in suffering, deprivation, and even fatalities due to sickness, accidents, disruptions in commercial operations, and the partial or complete loss of vital infrastructure, including houses, hospitals, and other buildings, as well as roads, bridges, electricity lines, and other structures. Disasters often fall into two categories: man-made and natural. Natural disasters include storms, floods, cyclones, droughts, earthquakes, heat waves, and cold waves. A few examples of man-made disasters are food poisoning, chemical pollution, prawn farming, epidemics, deforestation, and environmental damage

Keywords: Educational package, disaster preparedness, high school Students

1.INTRODUCTION

A disaster is a life disturbing event occurring over a period of time that causes widespread human, material, economic or environmental loss which exceeds the ability of the affected community or society to cope using its own resources.[1] Disasters are routinely divided into either "natural disasters" caused by natural hazards or "human-instigated disasters" caused

from anthropogenic hazards. However, in modern times, the divide between natural, human-made and human-accelerated disasters is difficult to draw.[2] Examples of natural hazards include avalanches, flooding, cold waves and heat waves, droughts, earthquakes, cyclones, landslides, lightning, tsunamis, volcanic activity, wildfires, and winter precipitation. Examples of anthropogenic hazards include criminality, civil disorder, terrorism, war, industrial hazards, engineering hazards, power outages, fire, hazards caused by transportation, and environmental hazards.[3]

The frequency of an event and the magnitude of its impact influence whether an event is regarded as a disaster. Events with a low frequency of occurrence and a high magnitude of impact (in terms of large economic and human losses)—such as the death and damage caused by a famine severe earthquake, flood, or tropical cyclone, or the harm produced by the large release of poison gas by a chemical plant—are usually declared disasters by government authorities. Events with a high frequency of occurrence and a low magnitude of impact—such as a seasonal disease outbreak, the absence of rain during the dry season, or the annual number of deaths due to automobile accidents—might be regarded as normal or routine events. The determination of what levels are high and what levels are low, however, can be subjective and may vary by culture, prior history with the type of event, and ability to respond to the event. Thus, disasters of similar characteristics might be viewed differently in different settings.[4]

Knowledge of disaster is important basis for preparing the individual to face the threat of disaster, in particular the natural disaster. Children as the vulnerable group can be provided earlier about disaster knowledge and education especially in the school environment. Education is considered as one of the various efforts to reduce disaster risks.[2]

Disasters are unpredictable and can only be dealt by effective disaster management programs. Students can prove to be useful workforce in disaster situation. College students need to know basic plan of action to be carried in an emergency. It is not possible to prevent disasters, but it is possible to be prepared. Students can be made aware regarding the impacts of disasters through formal and informal education. The practices regarding disaster preparedness training and performance of drills are largely negative and sincere work needs to be done in this direction.

2.OBJECTIVES

1. To assess the existing knowledge regarding disaster preparedness among high school students.
2. To determine the effectiveness of educational package knowledge regarding disaster preparedness among high school students.
3. To find out association between knowledge regarding disaster preparedness among high school students with selected demographic variables.

3.MATERIAL AND METHODS:

A quantitative research study was done to assess the effectiveness of an educational package on knowledge of students regarding disaster preparedness among high school students. quasi-experimental one group pretest posttest design was adopted for the present study. **Sample:** The accessible population for the study consists of high school students**. Method:** Data was collected using self structured knowledge questionnaires.

The collected data was organized in master data sheet and analyzed using descriptive and inferential statistics as per the objectives of the study.

Research approach: The research approach chosen for the study was Quantitative research approach.

Research design: The research design adopted for the present study was Quasi experimental research design (one group pretest posttest design).

Setting of the study: The study was conducted in Adityanath Jha Inter college, Rudrapur, Uttarakhand.

Sample size: 160 students were selected for the study.

Sampling technique: purposive sampling technique was used to select the sample from the population.

Data-collection:

- Administrative permission would be obtained from Principal of at Adityanath Jha Inter College Rudrapur, Uttarakhand".
- Ethical permission would take from ethical committee, BIU.
- Purpose of study will explain to participant and informed written consent would take from them.
- Pretest would be taken by using self-structure knowledge questionnaire and observational checklist.
- Educational Package on disaster preparedness would be given to participants.
- Posttest would be taken by using self-structure knowledge questionnaire and observational checklist.

CRITERIA MEASURES

All of the tool's components were analyzed using graphs, percentage distributions, frequency distributions, and the Chi-square test.

RESULT

Majority of students (52.5%) were in >18 years of age, Majority of high school students (58%) were male, Majority of high school students (31.25%) were in X standard, Majority of high school students (50%) were Hindu, Majority of high school students (45.62%) were living in urban area, Majority of high school students (60%) were having T.V as their source of information about disaster preparedness.

The study revealed that there was no significant association with their demographic variables i.e., age, gender, religion, area of living, previous information regarding disaster preparedness, source of information regarding disaster preparedness.

Pre-test knowledge score was 98.1% (Inadequate knowledge), 1.9% (Moderate knowledge), 00% (adequate knowledge) & in the post test knowledge score was 9.37% (Inadequate knowledge), 88.12% (Moderate knowledge), and 2.5%

(adequate knowledge).

The study revealed that there was no significant association with their demographic variables i.e., age, gender, standard (class) and religion, residential area mechanical previous experience of disaster preparedness, source of information. The results also revealed that the mean post-test knowledge score (14.05±3.03) was greater than the mean pre-test knowledge score (6.99±2.00) The calculated t value was (t=-25.21), which were found to be highly significant at the 0.05 level of significance, Therefore, it shows that an educational package was effective to improve the level of knowledge of High School students. This study aimed to assess the effectiveness of an educational package on knowledge regarding disaster preparedness among high school students. An educational package was an effective teaching method to teach the participants and also helps to enhance the knowledge of the high school students regarding the disaster preparedness.

RESULTS

Table No. 1 shows frequency and percentage distribution of demographic variables of study participants & it depicts that age Majority of students (52.5%) were in >18 years of age, Majority of high school students (58.75%) were male, Majority of high school students (31.25%) were in X standard, Majority of high school students (50%) were Hindu, Majority of high school students (45.62%) were living in urban area, Majority of high school students (60%) were having T.V as their source of information about disaster preparedness.

DISTRIBUTION OF FREQUENCY AND PERCENTAGE OF DEMOGRAPHIC VARIABLES

S.NO.	DEMOGRAPHIC VARIABLES	FREQUENCY	%
1.	**Age**		
	a) <15 years	**-**	**-**
	b) 16-18 years	**76**	**47.5%**
	c) > 18 years	**84**	**52.5%**
2.	**Gender**		
	a) Male	**94**	**58.75%**
	b) Female	**66**	**41.25%**
3.	**Standard (class)**		
	a) IX	**39**	**24.37%**
	b) X	**50**	**31.25%**
	c) XI	**45**	**28.12%**
	d) XII	**26**	**16.25%**

4.	**Religion** a) Hindu b) Christian c) Muslims d) Others	 **80** **40** **40** **-**	 **50%** **25%** **25%** **-**
5.	**Residential Area** **a)** Urban **b)** Rural **c)** Semi- urban **d)** Semi-rural	 **73** **50** **37** **-**	 **45.62%** **31.25%** **23.12%** **-**
6.	**Previousexperience of disaster** a) Yes b) No	 **137** **23**	 **85.62%** **14.37%**
7.	**Source of information** a) TV b) Radio c) Internet d) Newspaper	 **96** **-** **59** **05**	 **60%** **-** **36.87%** **3.12%s**

Table 2: EFFECTIVENESS OF AN EDUCATIONAL PACKAGE PROGRAMME ON KNOWLEDGE REGARDING DISASTER PREPAREDNESS AMONG HIGH SCHOOL STUDENTS.

LEVEL OF KNOWLEDGE	**Pre-test knowledge score**			**Post-test knowledge score**	
	Score	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Inadequate knowledge	0-10	157	98.1%	15	9.37%

Moderate knowledge	11-20	03	1.9%	141	88.12%
Adequate knowledge	21-30	0	0%	04	2.5%
Total		**160**	**100%**	**160**	**100%**

Shows pre-test knowledge score was 98.1% (Inadequate knowledge), 1.9% (Moderate knowledge), 00% (adequate knowledge) & in the post test knowledge score was 9.37% (Inadequate knowledge), 88.12% (Moderate knowledge), and 2.5% (adequate knowledge). Therefore, it may be concluded that the majority of respondents had low pre-test knowledge scores. There was an increase in responders who had experience with organized educational package following their implementation.

Table 3: Comparison pre-test and post-test knowledge score of an educational package programme on knowledge regarding disaster preparedness among high school students.

S.NO.	Knowledge aspects	Mean	Mean%	SD	t value	C value	df
1	**Pre-test**	**6.99**	**4.36%**	**2.00**	**-25.21**	**0.781**	**159**
2	**Post-test**	**14.05**	**8.78%**	**3.03**			

Shows mean pre-test knowledge score was 6.99 and mean post –test knowledge score was 14.05 the difference between pre-test knowledge score was statistically significant.
Hence, it was inferred that there was an increase in the level of knowledge after educational package programme regarding disaster preparedness among high school students. So the research hypothesis was accepted.

Table 4: Effectiveness of an educational package programme on knowledge regarding disaster preparedness among high school students.

LEVEL OF KNOWLEDGE	**Pre-test knowledge score**			**Post-test knowledge score**	
	Score	**Frequency**	**Percentage**	**Frequency**	**Percentage**

Inadequate knowledge	**0-10**	**157**	**98.1%**	**15**	**9.37%**
Moderate knowledge	**11-20**	**03**	**1.9%**	**141**	**88.12%**
Adequate knowledge	**21-30**	**0**	**0%**	**04**	**2.5%**
Total		**160**	**100%**	**160**	**100%**

Shows pre-test knowledge score was 98.1% (Inadequate knowledge), 1.9% (Moderate knowledge), 00% (adequate knowledge) & in the post test knowledge score was 9.37% (Inadequate knowledge), 88.12% (Moderate knowledge), and 2.5% (adequate knowledge). Therefore, it may be concluded that the majority of respondents had low pre-test knowledge scores. There was an increase in responders who had experience with organized educational package following their implementation.

Table 5: Association of level of knowledge score regarding disaster preparedness among high school students.

S. N	Demographic variables	Inadequate knowledge		Moderate knowledge		Adequate knowledge		df	Calculated value	Table value
		F	%	F	%	F	%			
1	**Age** a) <15 years b) 16-18 years c) >18 years	00 00 00	0% 0% 0%	00 04 65 50	0% 28.75 % 31.25 %	00 03 03 04	0% 18.75 % 21.25 %	4	0.015	2.78
2	**Gender** a) Male b) Female	30 16	18.75 % 10%	10 10 10	6.25% 6.25%	54 40 0	33.75 % 25%	2	1.46	4.30
3	**Standard (Class)** a) IX b) X c)XI d)XII	10 20 15 04	6.25% 12.5% 9.37% 2.5%	10 15 15 10 10	6.25% 9.37% 6.25% 6.25%	19 15 20 12	11.87 % 9.37% 12.5% 7.5%	6	10.48	2.45

4	**Religion** a) Hindu b) Christian c) Muslims d) Others	30 05 10 00	18.75 % 3.12% 6.25% 0%	30 20 12 00	18.75 % 12.5% 7.5% 0%	20 15 18 00	12.5% 9.37% 11.25 % 0%	6	11.74	2.45
5	**Residential Area** a)Urban b) Rural c) Semi urban d) Semi Rural	10 05 10 0	6.25% 3.12% 6.25% 0%	20 10 15 00	0% 6.25% 9.37% 0%	43 35 12 0	26.87 % 21.87 % 7.5% 0%	6	12.96	2.45
6	**Previous experience of disaster** a)Yes b) No	10 10	6.25% 6.25%	50 00 05	31.25 % 3.12%	77 08	48.12 % 8%	2	23.65	4.30
7	**Source of information** a)TV b)Radio c) Internet d) Newspaper	00 06 00 06	0% 3.75% 0% 3.75%	50 00 45 03	31.25 % 0% 28.12 % 1.87%	40 00 08 02	25% 0% 5% 1.25%	6	8.85	2.45

DISCUSSION

The aim of the present study to evaluate the knowledge of High school students regarding 160 students was selected for the study group to assess their knowledge regarding disaster preparedness.

OBJECTIVES

1. **1.To assess the existing knowledge regarding disaster preparedness among high school students.**
   The data from the present study showed that the pretest level of knowledge score regarding disaster preparedness among high school students before administration of educational package was inadequate about 98.1%, and 1.9% were having moderate level of knowledge.

2. **Effectiveness of an educational package programme on knowledge regarding disaster preparedness among high school students.**
   Pre-test knowledge score was 98.1% (Inadequate knowledge), 1.9% (Moderate knowledge), 00% (adequate knowledge) & in the post test knowledge score was 9.37% (Inadequate knowledge), 88.12% (Moderate knowledge), and 2.5% (adequate knowledge).

3. **To find out association between knowledge regarding disaster preparedness among high school students with selected demographic variables.**

Age: Shows percentage wise distribution of high school students with relationship to their age, 0 (0%) were in <15 years, 76 (47.50%) were in 16-18 years, 84 (52.50%) were in >18 years.
Gender: Shows percentage wise distribution of high school students with relationship to their gender, 94 (58.75%) were in Male, 66 (41.25%) were in Female.
Standard (class): Shows percentage wise distribution of high school students with relationship to their Standard (class), 39 (24.37%) were in IX, 50 (31.25%) were in X, 45 (28.12%) were in XI, 26 (16.25%) were in XII.
Religion: Shows percentage wise distribution of high school students with relationship to their Religion, 80 (50%) were in Hindu, 40 (25%) were in Christian, 40 (25%) were in Muslims, 00 (0%) were in others.
Residential area: Shows percentage wise distribution of high school students with relationship to their Residential area, 73 (45.62%) were in urban, 50 (31.25%) were in rural, 37 (23.12%) were in semi-urban, 00 (0%) were in semi-rural.
Previous experience of disaster: Shows percentage wise distribution of high school students with relationship to their Previous experience of disaster, 137 (85.62%) were in Yes, 23 (14.37%) were in No.
Source of information: Shows percentage wise distribution of high school students with relationship to their Source of information, 96 (60%) were in TV, 0 (00%) were in Radio, 59 (36.87%) were in Internet, 05(3.12%) were in Newspaper.

CONCLUSION

Based on the finding of the following conclusion were drawn:

- There is need to provide knowledge regarding disaster preparedness
- Educational package has significantly increase knowledge of High school students regarding disaster preparedness.

Thus, the investigator concludes educational package was helping in increasing the knowledge of High school students of Adityanath Jha Inter College Rudrapur, Uttarakhand.

REFERENCES

1) "What is a disaster?". www.ifrc.org. International Federation of Red Cross and Red Crescent Societies. Retrieved 21 June 2017.
2) "Why natural disasters aren't all that natural". Open Democracy. 26 November 2020. Archived from the original on 29 November 2020. Retrieved 29 December 2020.
3) "Natural Hazards | National Risk Index". hazards.fema.gov. Retrieved 8 June 2022.
4) Ritchie H, Rosado P, Roser M. Natural Disasters. Our World in Data [Internet]. 2022 [cited 2023 May 30]; Available from: https://ourworldindata.org/natural-disasters
5) ShruthiNagarajaShetty. A Study to assess the Effectiveness of Structured Teaching Programme on Knowledge regarding Disaster Preparedness and Mitigation among Secondary school Students from Selected Schools of Ahmedabad City. Asian J. Nursing Education and Research. 2019; 9(3): 317-322. doi: 10.5958/2349-2996.2019.00068.5
6) National disaster management in India and disaster risk reduction programme [Online].(2009-2012) from ministry of home affairs URL:http//www.ndmindia.nic.in
7) AbhasK,Jennifer E, Center for Research on Epidemiology of Disaster.[Online]. 2003, Available from URL http://wwwcred.com
8) National Committee on Disaster Management (NCDN) Report. Available from http://info.worldbank.org
9) Ala A. Risk reduction and emergency preparedness. WorldHealth Organization.[Online]. 3rd ed Geneva.2004 Aug; 5(9):[2- 9][20-25].Available
10) Dr. NaryanaJayaprakash. Report on flood statistics, Karnataka. 2009. Available at http://www/indiatimes.com.
11) Ala A. Risk reduction and emergency preparedness. World Health Organization. (online). 3rd edition Geneva. 2004 Aug; 5(9): [2-9]. [20-25]. Available
12) Wise G. preparing disaster. Disaster manage response. 2007 Jan-Mar;5(1):14- available from URL http://www.delhi.gov.in/Dolt DM/vbo.pdf
13) Alkalash SH, AlhashmiAlamer EH, Allihyani AM, Alhazmi AS, Alharthi RM, Bugis AM. Knowledge of and Attitude Toward Disaster Preparedness Among Secondary School Students in the Western Region of Saudi Arabia. Cureus. 2023 Jan 18;15(1):e33926. doi: 10.7759/cureus.33926. PMID: 36819388; PMCID: PMC9937084.
14) NM Brands. a rallying cry that explores the experiences of volunteers for American Red Cross emergency assistance. Available at https://ir.library.illinoisstate.edu/mts/11 are the Master's Theses in Sociology and Anthropology from 2014.
15) Indian government agency responsible for managing national disasters.(Visit website).In 2019.2019 June 8 (cited).At https://ndma.gov.in/en/vulnerabilityprofile.html
16) R. Ronan, D. Johnston, and J. Paton, "Disaster preparedness for children and families: a critical review," Current Psychiatry Reports, vol. 17, no. 7, 2015.
17) E. Johnson, "High school students' knowledge and attitudes about disaster preparedness," Journal of Emergency Management, vol. 18, no. 4, pp. 317-326, 2020.
18) S. Shiwaku, A. Shaw, R. Kandel, M. Shrestha, and H. Dixit, "Role of school education in disaster mitigation: a case study of Nepal," International Journal of Mass Emergencies and Disasters, vol. 25, no. 1, pp. 87-94, 2007.
19) K. Mutch, "The role of schools in disaster preparedness, response and recovery: what can we learn from the literature?," Pastoral Care in Education, vol. 32, no. 1, pp. 5-22, 2014.
20) A. Farahani, "Enhancing disaster preparedness education through technology: a case study of digital learning tools," Journal of Educational Technology Development and Exchange, vol. 12, no. 2, 2019.

21) Mishra, S., Patnaik, S., & Das, R. (2017). Disaster Preparedness for School Education in India. International Journal of Current Research and Review, 9(6), 56-61.
22) International Federation of Red Cross and Red Crescent Societies. (2014). Public awareness and public education for disaster risk reduction: Key messages.
23) Ronan, K. R., & Johnston, D. M. (2001). Correlates of Hazard Education Programs for Youth. Risk Analysis, 21(6), 1055-1063.
24) Petal, M. (2008). Disaster risk reduction education: Material development, organization, evaluation. International Conference on School Safety.
25) Finnis, K., Johnston, D., Ronan, K., & White, J. (2010). Hazard Perceptions and Preparedness of Taranaki Youth. Disaster Prevention and Management: An International Journal, 19(2), 175-184.
26) Shiwaku, K., & Shaw, R. (2008). Proactive co-learning: A new paradigm in disaster education. Disaster Prevention and Management: An International Journal, 17(2), 183-198.
27) Haynes, K., & Tanner, T. M. (2015). Empowering young people and strengthening resilience: Youth-centred participatory video as a tool for climate change adaptation and disaster risk reduction. Children's Geographies, 13(3), 357-371.
28) Tang, A., Kruger, J., Quan, R., &Zabaneh, J. (2018). Public health implications of disasters: Assessing preparedness and response in high school students. Public Health, 165, 124-131.
29) Johnson, V. A., Ronan, K. R., Johnston, D. M., & Peace, R. (2014). Evaluations of disaster education programs for children: A methodological review. International Journal of Disaster Risk Reduction, 9, 107-123.
30) Bolt BA. earthquake. In: Encyclopedia Britannica. 2023.
31) Recent earthquakes and their magnitudes in India [Internet]. Worlddata.info. [cited 2023 May 30]. Available from: https://www.worlddata.info/asia/india/earthquakes.php
32) Tormey, R., & Campion, K. (2023). "Education for disaster preparedness: A review of the current evidence." International Journal of Disaster Risk Reduction, 77, 103010.
33) Liu, Y., & Li, X. (2023). "Sustaining disaster preparedness knowledge among adolescents: A longitudinal study." Education and Disaster Management, 29(3), 312-329.
34) Kumar, P., & Singh, S. (2023). "Digital interventions in disaster preparedness education for youth." Journal of Educational Technology & Society, 26(1), 45-59.
35) Garcia, M. L., & Hedges, S. (2023). "Culturally responsive disaster education: A comprehensive review." Multicultural Education Review, 15(2), 178-195.
36) Evans, L., & O'Brien, T. (2023). "Peer-led disaster preparedness programs: Effectiveness and outcomes." Youth & Society, 54(6), 1253-1271.
37) Williams, D., & Martinez, L. (2023). "Psychosocial effects of disaster education on high school students." Journal of Adolescent Health, 72(4), 578-587.
38) Nguyen, P. T., & Tran, M. D. (2023). "Community engagement in disaster preparedness education: Benefits and challenges." Community Development Journal, 58(1), 97-113.
39) Smith, K., & Lewis, H. (2023). "The impact of simulation-based training on disaster preparedness." Journal of Emergency Management, 21(2), 148-162.
40) Miller, S., & Clark, A. (2023). "Curricular integration of disaster preparedness education: A systematic review." Curriculum Studies, 55(1), 73
41) Bhandari AK, Rahman M, Takahashi O. Enhancing earthquake preparedness knowledge and practice among Nepalese immigrants residing in Japan. Scientific Reports. 2023 Mar 18;13(1):4468.
42) Smith, J. A., & Brown, C. (2022). "Methodological approaches to assessing disaster preparedness education." Journal of Educational Research, 115(2), 189-204.
43) Jensen, R., & Thompson, B. (2022). "Exploring gender disparities in disaster preparedness education." Journal of Gender Studies, 31(4), 398-412.

44) Roberts, A., & Bailey, K. (2022). "E-learning vs. classroom learning in disaster preparedness education." Distance Education, 43(3), 467-484.
45) White, E., & Green, J. (2022). "Teachers as facilitators of disaster preparedness knowledge." Teaching and Teacher Education, 117, 103784.
46) Johnson, P., & Hall, T. (2022). "Development and validation of assessment instruments for disaster education." Educational Measurement: Issues and Practice, 41(3), 34-50.
47) Thompson, L. (2022). Journal of Gerontological Social Work, 65(1), 123-138.
48) Al-Rousan, T. (2022). Journal of Disaster Risk Reduction, 55, 102070.
49) Kim, Y. (2021). Journal of Community Resilience, 52(3), 198-209.
50) Lee, C. (2020). International Journal of Disaster Risk Reduction, 15(4), 230-237.