

Effectiveness of Structured Teaching Programme on Knowledge Regarding Disaster Preparedness Among Young Adults in Selected Rural Community Areas of Kanpur: A Systematic Review

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Abstract

Disasters are major public health emergencies that can cause loss of life, injuries, displacement, destruction of property, interruption of essential services, psychological distress, and disruption of community functioning. Adequate disaster preparedness knowledge is essential for individuals and communities to respond effectively during emergencies. Young adults represent an important population for disaster preparedness because they can protect themselves, assist family members, support vulnerable individuals, and participate in community response activities. Rural communities may experience additional challenges because of limited access to healthcare facilities, emergency services, transportation, communication systems, trained personnel, and disaster-management resources.

The present systematic review was carried out to assess the effectiveness of Structured Teaching Programmes and other educational interventions in improving knowledge regarding disaster preparedness among young adults, adults, adolescents, students, and community populations. A systematic literature review was performed using evidence from studies addressing disaster preparedness education, awareness programmes, community-based interventions, simulation, digital education, virtual reality, disaster drills, case-based learning, and other educational approaches. Thirty studies and reviews were included in the evidence synthesis according to predetermined eligibility considerations. The reviewed studies included randomized controlled trials, quasi-experimental studies, pre-experimental studies, community-based interventions, mixed-method studies, systematic reviews, and scoping reviews. The findings showed that educational interventions generally improved disaster preparedness knowledge, preparedness attitudes, self-efficacy, confidence, practical skills, psychological preparedness, and preparedness practices.

The evidence from rural communities was particularly relevant. Manisha (2021), in a quasi-experimental study among 80 adults in rural areas of Dehradun, reported an increase in the mean knowledge score from 15.35 before the intervention to 30.05 after the awareness programme. In the post-test, 82.5% of participants in the experimental group had good knowledge and none had poor knowledge. Community-based interventions also demonstrated positive outcomes. Rajeswari et al. (2025), among 414 women in coastal villages, reported significant improvements in knowledge, attitudes, and disaster-preparedness skills following community change-agent training. Makmon et al. (2026), in a cluster randomized controlled study among 287 adolescents, reported significant improvement in flood-preparedness scores immediately after intervention and at three-month follow-up.

In conclusion, the review suggests that Structured Teaching Programmes and other educational interventions are effective tools for improving disaster preparedness knowledge and related preparedness outcomes. Community-based and structured educational approaches are particularly relevant for rural populations. The findings support the need for regular, locally relevant disaster preparedness education among young adults living in rural communities, including selected rural community areas of Kanpur.

Keywords: Disaster Preparedness, Structured Teaching Programme, Disaster Education, Young Adults, Rural Community, Health Education, Disaster Awareness, Emergency Preparedness, Community Health Nursing

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INTRODUCTION

Disasters are major public health emergencies that can result in loss of life, injuries, displacement, destruction of property, interruption of essential services, psychological distress, and disruption of

community functioning. Natural disasters such as earthquakes, floods, cyclones, landslides, storms, and other hazards may occur with limited warning and can severely affect individuals, families, and

communities. The impact of disasters depends not only on the severity of the hazard but also on the preparedness and response capacity of individuals and communities.

Disaster preparedness refers to the knowledge, skills, capacities, plans, resources, and actions developed before a disaster to enable individuals and communities to respond effectively. Important components include awareness of hazards, early warning systems, emergency communication, evacuation procedures, emergency supplies, first aid, family disaster planning, safe sheltering, and appropriate emergency-response behaviours.

Young adults are an important population for disaster preparedness because they can protect themselves, assist family members, support vulnerable individuals, and participate in community response activities. However, physical ability alone does not ensure an effective disaster response. Adequate knowledge, preparedness, confidence, and appropriate response behaviours are essential for effective action during emergencies.

Rural communities may experience additional challenges because of limited access to healthcare facilities, emergency services, transportation, communication systems, trained personnel, and disaster-management resources. These limitations may increase vulnerability during emergencies. Therefore, community-based disaster preparedness education is an important component of disaster-risk reduction in rural areas.

Health education is an effective strategy for improving awareness and preparedness. A Structured Teaching Programme provides organized and systematic information according to predetermined objectives and can be delivered through lectures, discussions, demonstrations, audiovisual materials, case-based learning, and practical activities.

Evidence from rural communities supports the effectiveness of structured disaster education. Manisha (2021), in a quasi-experimental study among 80 adults in rural areas of Dehradun, reported that the experimental group's mean knowledge score increased from 15.35 before the intervention to 30.05 after the awareness programme. In the post-test, 82.5% of participants in the experimental group had good knowledge and none had poor knowledge. Community-based interventions have also demonstrated positive effects. Studies among earthquake-prone, flood-prone, and coastal communities have reported improvements in disaster preparedness knowledge, attitudes, and skills following educational or participatory interventions. The 2025 study by Rajeswari et al. among 414 women in coastal villages found significant improvements in knowledge, attitudes, and disaster-preparedness skills following training delivered through community change agents.

Educational interventions among adolescents and younger populations have similarly demonstrated positive results. Makmon et al. (2026), in a cluster randomized controlled study among 287 adolescents in Selangor, found that theory-based flood-disaster education significantly increased preparedness scores immediately after intervention and at three-month follow-up.

Therefore, assessing the effectiveness of a Structured Teaching Programme on disaster preparedness among young adults in selected rural community areas of Kanpur is important. The findings may help community health nurses and other healthcare professionals plan effective disaster preparedness education and strengthen community-level preparedness.

METHODS

A systematic review technique was adopted to evaluate the effectiveness of Structured Teaching Programmes and other educational interventions on disaster preparedness knowledge and related outcomes. The review focused on evidence involving adults, young adults, adolescents, students, healthcare professionals, and community populations.

A comprehensive literature search was considered across electronic databases such as PubMed/MEDLINE, Google Scholar, Scopus, CINAHL, Cochrane Library, ScienceDirect, and Web of Science.

Keywords used in the search approach included:

- Disaster Preparedness
- Disaster Readiness
- Emergency Preparedness
- Disaster Management
- Disaster Education
- Disaster Awareness
- Structured Teaching Programme
- Educational Intervention
- Awareness Programme
- Health Education
- Community Education
- Simulation
- Disaster Drill
- Virtual Reality
- Digital Education
- Knowledge
- Young Adults
- Adults
- Adolescents
- Rural Community

The search strategy focused on combinations of terms related to disaster preparedness, educational interventions, knowledge, preparedness, and relevant population groups.

Studies were considered according to predetermined inclusion and exclusion criteria. Relevant studies included experimental, randomized controlled, quasi-experimental, pre-experimental, community-

based, mixed-method, systematic review, and scoping review designs that assessed educational interventions and disaster preparedness outcomes. The evidence synthesis consisted of **30 studies/reviews**. The data extracted included author and year, country or setting, study design, sample size, study population, type of disaster, educational intervention, outcome measures, major findings, and conclusions.

Methodological quality was intended to be examined using standardized critical appraisal approaches appropriate to the study design, including the Joanna Briggs Institute (JBI) Critical Appraisal Checklists and Critical Appraisal Skills Programme (CASP) tools. However, complete individual appraisal scores were not available in the supplied evidence and therefore have not been fabricated.

The findings were synthesized narratively because the included studies differed considerably in population, intervention, disaster type, measurement instruments, and outcomes. A pooled meta-analysis was therefore not performed from the supplied evidence summaries.

FINDINGS

Knowledge Deficits Regarding Disaster Preparedness

The review identified gaps in knowledge regarding disaster hazards, warning systems, emergency communication, evacuation procedures, emergency supplies, first aid, family disaster planning, and appropriate response behaviours among adults, young people, students, and community populations.

Several studies reported inadequate awareness regarding:

1. Disaster hazards and associated risks.
2. Early warning systems and emergency communication.
3. Evacuation procedures and safe sheltering.
4. Emergency preparedness and disaster-response measures.
5. First aid and basic emergency response.
6. Emergency kits and family disaster planning.
7. Appropriate preparedness practices at the household and community level.

Studies conducted among rural and community populations demonstrated that baseline disaster preparedness knowledge could be inadequate before educational interventions.

Effectiveness of Educational Interventions

The majority of reviewed studies demonstrated positive outcomes following educational interventions.

Major findings included:

1. Improved knowledge regarding disaster preparedness.
2. Increased awareness of disaster hazards and warning systems.

3. Improved understanding of evacuation and emergency procedures.
4. Increased disaster preparedness confidence and self-efficacy.
5. Improved practical preparedness skills.
6. Improved attitudes towards disaster preparedness.
7. Improvement in preparedness practices.
8. Improvement in psychological preparedness in selected populations.

The reviewed evidence included structured teaching, awareness programmes, community participation, school-based education, simulation, case-based learning, disaster drills, virtual reality, digital education, online education, and virtual tabletop exercises.

Unlike the cancer review format, a single overall percentage of “significant improvement” has **not** been calculated here because the supplied studies used different outcomes and statistical measures. Reporting one pooled percentage without a formal quantitative synthesis would be methodologically misleading.

Community-Based Disaster Preparedness Education

Several studies emphasized the importance of community settings as effective platforms for disaster preparedness education.

Research conducted among rural and community populations demonstrated that:

- Community-based teaching improved disaster preparedness knowledge.
- Participatory interventions improved preparedness attitudes and practices.
- Community change-agent training improved knowledge, attitudes, and skills.
- Educational programmes were useful in populations with limited access to formal disaster-management resources.
- Community participation strengthened preparedness beyond individual knowledge.

The evidence from Manisha (2021) is particularly relevant because the study was conducted among adults residing in rural areas. The large increase in mean knowledge score following the awareness programme indicates that structured educational intervention can substantially improve disaster preparedness knowledge in a rural population.

Rajeswari et al. (2025) further demonstrated significant improvements in knowledge, attitudes, and disaster-preparedness skills among women in coastal villages following community change-agent training.

Young Adults and Adolescent Disaster Education

Young people are an important target population for disaster preparedness education.

Studies among adolescents and students demonstrated that structured disaster education can

improve preparedness knowledge, self-efficacy, and preparedness scores.

Setioputro et al. demonstrated significant improvement in disaster preparedness knowledge and self-efficacy among Indonesian adolescents following a school-based programme.

Makmon et al. reported significantly higher flood-preparedness scores among adolescents immediately following intervention and at three months.

These findings support the importance of providing disaster education to younger populations before disasters occur. Young adults may also serve as important resources within families and communities during emergencies.

Structured Teaching and Awareness Programmes

The strongest directly relevant evidence comes from studies evaluating structured teaching and awareness-based approaches.

Manisha (2021) reported a substantial improvement in disaster preparedness knowledge among rural adults following an awareness programme.

Shetty (2019) reported significant improvement in disaster preparedness and mitigation knowledge following a Structured Teaching Programme.

Quadras et al. also reported improvement in flood preparedness following an awareness programme.

Together, these studies provide direct support for the use of structured educational interventions to improve disaster preparedness knowledge.

Simulation and Disaster Drills

Simulation and disaster drills were used in several studies to develop practical preparedness and response abilities.

The reviewed studies reported improvements in:

- Disaster-response knowledge.
- Practical skills.
- Confidence.
- Preparedness competency.
- Willingness to respond.
- Performance during simulated emergencies.

However, simulation should not automatically be considered superior to conventional teaching. One study comparing case-based learning with simulation reported better short-term disaster-triage knowledge with case-based learning.

Therefore, the choice of educational method should depend on the learning objectives, available resources, population characteristics, and desired outcomes.

Virtual Reality and Technology-Assisted Education

Virtual reality-based educational interventions demonstrated improvement in disaster preparedness, knowledge, skills, confidence, and psychological preparedness in several studies.

Digital education and online educational programmes also improved disaster literacy, preparedness beliefs, knowledge, and confidence.

These approaches provide opportunities for interactive learning. However, their application in rural communities may be limited by availability of technology, internet connectivity, digital literacy, equipment, and trained personnel.

Therefore, technology-assisted education may complement rather than automatically replace face-to-face Structured Teaching Programmes in rural settings.

Disaster Preparedness Skills and Self-Efficacy

The review showed that disaster education can influence outcomes beyond knowledge.

Several studies reported improvements in:

1. Disaster preparedness confidence.
2. Self-efficacy.
3. Psychological preparedness.
4. Practical response skills.
5. Preparedness attitudes.
6. Willingness to respond.
7. Community preparedness practices.

Rajeswari et al. demonstrated improvements in knowledge, attitudes, and skills among women receiving community change-agent training.

Similarly, Makmon et al. demonstrated significant improvements in flood preparedness among adolescents both immediately after intervention and at three-month follow-up.

RESEARCH GAP

Although the literature provides substantial evidence supporting disaster preparedness education, several important gaps remain.

Many studies have focused on:

- Nursing students.
- Healthcare professionals.
- School students.
- Adolescents.
- Emergency personnel.

Comparatively fewer studies specifically focus on **young adults living in rural communities**.

Many studies also used small samples, purposive or convenience sampling, one-group pre-test-post-test designs, and short follow-up periods. Furthermore, knowledge was measured more frequently than actual preparedness behaviour.

Therefore, there is a need for further research among young adults residing in rural communities, particularly using locally relevant Structured Teaching Programmes and longer-term outcome assessment.

DISCUSSION

The findings of the present review provide evidence supporting the effectiveness of Structured Teaching Programmes and other educational interventions in improving disaster preparedness knowledge and related outcomes.

Most reviewed studies demonstrated positive changes following educational interventions. The

review highlights the importance of health education in addressing knowledge gaps and developing preparedness at individual, family, and community levels.

The evidence from rural populations is particularly important for the proposed study. Manisha (2021) demonstrated a substantial increase in knowledge among rural adults following an awareness programme, with the mean knowledge score increasing from 15.35 to 30.05.

Community-based education also demonstrated broader benefits. Rajeswari et al. reported improvements in knowledge, attitudes, and skills following community change-agent training among women in coastal villages.

The evidence among adolescents is also relevant. Makmon et al. demonstrated significant improvement in flood preparedness immediately after intervention and at three months. This supports the value of structured and theory-based disaster education among younger populations.

The review further demonstrates that educational interventions can influence multiple dimensions of preparedness. Knowledge is the most frequently assessed outcome, but several studies also evaluated attitudes, self-efficacy, confidence, psychological preparedness, practical skills, and preparedness practices.

Simulation and practical exercises appear useful for developing response skills. However, the evidence does not justify the claim that simulation is always superior to structured teaching. Educational methods should be selected according to the needs of the population and the intended learning outcomes.

Technology-based interventions such as virtual reality and digital education are promising approaches. Nevertheless, their feasibility in rural communities must be considered carefully because technological infrastructure and digital literacy may be limited.

An important finding is the relative lack of evidence specifically involving young adults in rural communities. Much of the existing literature focuses on students, healthcare professionals, or adolescents. This population gap provides a strong rationale for conducting the proposed study among young adults in selected rural community areas of Kanpur.

The findings therefore support the implementation of a locally relevant Structured Teaching Programme covering disaster hazards, warning systems, emergency communication, evacuation, emergency kits, first aid, family disaster planning, and appropriate disaster-response behaviours.

However, an important methodological point must be emphasized: improvement in post-test knowledge does not automatically establish long-term behavioural preparedness. Future studies should therefore assess retention of knowledge and translation of knowledge into actual preparedness practices.

Overall, the available evidence supports Structured Teaching Programmes as a practical and accessible strategy for improving disaster preparedness knowledge among young adults in rural communities.

RECOMMENDED STRATEGIES FOR DISASTER PREPAREDNESS EDUCATION

1. Regular community-based Structured Teaching Programmes should be conducted for young adults in rural communities.
2. Educational sessions should focus on locally relevant disaster hazards, warning systems, emergency communication, evacuation, and safe sheltering.
3. Information regarding emergency kits, family disaster plans, first aid, and emergency response should be included.
4. Educational materials such as booklets, posters, audiovisual aids, demonstrations, and digital resources should be used according to local availability.
5. Practical demonstrations and disaster drills should be incorporated where feasible to strengthen skills and confidence.
6. Community health nurses should actively participate in disaster preparedness education.
7. Collaboration among healthcare professionals, community leaders, local authorities, schools, and community organizations should be strengthened.
8. Disaster preparedness education should use simple language and examples relevant to the local community.
9. Periodic refresher education should be conducted to improve retention of knowledge.
10. Follow-up assessment should be undertaken to determine whether improvement in knowledge is sustained.
11. Future programmes should assess not only knowledge but also preparedness attitudes, self-efficacy, skills, and actual preparedness practices.
12. Digital and technology-assisted approaches may be incorporated where adequate infrastructure and digital literacy are available.

CONCLUSION

Disaster preparedness remains an important public health priority, particularly for rural communities that may experience limitations in emergency services, transportation, communication, healthcare access, and disaster-management resources.

The present systematic review demonstrated that Structured Teaching Programmes and other educational interventions are effective in improving disaster preparedness knowledge and several related outcomes.

The reviewed evidence showed improvements in knowledge, preparedness attitudes, self-efficacy, confidence, practical skills, psychological preparedness, and preparedness practices following educational interventions. Community-based education was particularly useful in improving preparedness among rural and vulnerable populations.

The evidence from Manisha (2021) demonstrated substantial improvement in disaster preparedness knowledge among rural adults following an awareness programme. Rajeswari et al. demonstrated improvements in knowledge, attitudes, and skills following community change-agent training, while Makmon et al. demonstrated improvement in flood preparedness among adolescents with effects observed at three-month follow-up.

The findings support the implementation of regular, structured, and locally relevant disaster preparedness education among young adults in rural communities.

The evidence also identifies an important research gap because comparatively fewer studies have specifically focused on **young adults residing in rural communities**. Therefore, the proposed study among young adults in selected rural community areas of Kanpur is justified.

A Structured Teaching Programme can provide a systematic, practical, and accessible approach to improving disaster preparedness knowledge and may contribute to strengthening individual, family, and community preparedness.

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