RESEARCH PAPER

"Prepared to Respond: Effectiveness of a Disaster Management Training Module on Knowledge, Readiness, and Competence among ASHA Workers in Haryana"

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ABSTRACT

Background

Disasters significantly affect public health systems and require timely and efficient community-level responses. Frontline healthcare workers, particularly Accredited Social Health Activists (ASHA) workers, play a pivotal role in disaster preparedness and response at the grassroots level. However, inadequate knowledge, low perceived readiness, and limited competency among ASHA workers can adversely affect disaster management outcomes. Capacity-building interventions through structured training programs may enhance their preparedness and effectiveness during disasters.

Objective

To evaluate the effectiveness of a disaster management training module on knowledge, perceived readiness, and competence among ASHA workers in selected Primary Health Centres (PHCs) and Community Health Centres (CHCs) in Gurugram, Haryana.

Methods

A quasi-experimental pre-test post-test control group design was employed among 120 ASHA workers selected from PHCs and CHCs in Gurugram, Haryana. Participants were assigned equally to intervention (n=60) and control groups (n=60) using a non-probability purposive sampling technique. Baseline data regarding knowledge, perceived readiness, and competence were collected using validated structured questionnaires and competency assessment scales. The intervention group received a structured disaster management training module delivered through lectures, demonstrations, discussions, and simulation-based activities. Post-test assessment was conducted four weeks after the intervention. Data were analysed using descriptive and inferential statistics including paired t-test, independent t-test, and Pearson correlation analysis.

Results

Baseline assessment showed no statistically significant difference between intervention and control groups in knowledge ($p=0.721$), perceived readiness ($p=0.684$), and competence scores ($p=0.763$). Following implementation of the training module, the intervention group demonstrated significant improvement in mean knowledge scores from 13.62±3.14 to 24.83±2.76 ($t=21.84$, $p<0.001$), perceived readiness scores from 21.74±4.28 to 34.56±3.91 ($t=17.29$, $p<0.001$), and competence scores from 18.25±3.87 to 31.42±4.11 ($t=18.63$, $p<0.001$). The control group showed no significant changes. A moderate positive correlation was observed between knowledge and competence scores ($r=0.62$, $p<0.001$) and between perceived readiness and competence ($r=0.58$, $p<0.001$).

Conclusion

The disaster management training module was found to be effective in significantly improving knowledge, perceived readiness, and competence among ASHA workers. Structured educational interventions may strengthen disaster preparedness at the primary healthcare level and enhance the response capacity of frontline healthcare workers during emergencies.

Keywords: Disaster management, ASHA workers, training module, knowledge, perceived readiness, competence, quasi-experimental study, primary healthcare, disaster preparedness.

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Introduction

Disasters are serious events that disrupt the normal functioning of communities and healthcare systems, causing widespread human, social, environmental, and economic consequences. The increasing frequency of natural disasters, infectious disease outbreaks, industrial accidents, climate-related emergencies, and public health crises has intensified the need for preparedness and efficient response

mechanisms globally. Countries like India are particularly vulnerable due to high population density, rapid urbanization, industrial expansion, and diverse geographic conditions. Effective disaster management requires comprehensive preparedness at individual, community, and healthcare system levels. Disaster preparedness involves developing knowledge, skills, competencies, and readiness among healthcare personnel to respond effectively during emergencies. Community-level healthcare workers are considered the backbone of primary healthcare systems during disasters because they act as the first point of contact between healthcare services and the community. In India, Accredited Social Health Activists (ASHA) workers are frontline community health workers functioning under the National Health Mission. Their responsibilities include health education, disease surveillance, maternal and child healthcare services, immunization support, referral services, and community mobilization. Due to their close association with local populations, ASHA workers often become first responders during emergencies and disasters. Their role became particularly evident during the COVID-19 pandemic, where they contributed significantly to community awareness, contact tracing, screening, and monitoring activities. However, disaster situations demand specialized competencies that extend beyond routine healthcare responsibilities. Recent evidence suggests that although ASHA workers play a crucial role in community health systems, deficiencies in knowledge, practical skills, and preparedness continue to exist. A study assessing ASHA workers in Haryana found variable knowledge levels regarding healthcare responsibilities and highlighted the need for regular training interventions. Likewise, research conducted among ASHA workers in Karnataka identified disparities in awareness, practical performance, and simulation-based competencies between rural and urban settings. The effectiveness of structured training interventions among ASHA workers has been demonstrated in recent literature. A quasi-experimental study evaluating training related to Home-Based Newborn Care reported significant improvement in ASHA workers' knowledge and performance following educational intervention programs. Similarly, a mixed-method study evaluating the ECHO telemonitoring model for community healthcare workers reported improved knowledge acquisition and capacity building following structured training approaches. Emerging innovative learning strategies, including technology-assisted and interactive approaches, have also demonstrated promising outcomes for enhancing knowledge retention among community healthcare workers.

Recent initiatives have increasingly recognized the need for disaster preparedness training among frontline healthcare workers. In 2024, disaster preparedness orientation programs for ASHA workers and paramedical personnel were organized to strengthen heat-related emergency preparedness and community response capacities. Furthermore, recent disaster preparedness conferences in India have emphasized simulation exercises, practical drills, and interprofessional training to improve emergency response systems. Despite increasing recognition of disaster preparedness, studies specifically evaluating disaster management training among ASHA workers remain limited, particularly in primary healthcare settings. Existing literature primarily focuses on maternal health, newborn care, and routine health services rather than disaster preparedness competencies. Moreover, limited evidence is available regarding perceived readiness and competence outcomes following structured disaster management interventions. Gurugram district of Haryana represents a rapidly expanding urban and semi-urban region exposed to various disaster risks including infectious disease outbreaks, industrial hazards, environmental emergencies, and accidental incidents. Strengthening disaster preparedness among ASHA workers in selected Primary Health Centres (PHCs) and Community Health Centres (CHCs) may significantly enhance community resilience and emergency response capacity.

Therefore, the present study entitled **"A quasi-experimental study to evaluate the effectiveness of a disaster management training module on knowledge, perceived readiness, and competence among ASHA workers in selected PHC/CHC in Gurugram, Haryana"** is undertaken to assess the impact of a structured disaster management training module. Findings of this study may contribute evidence for policy formulation, training curriculum development, and strengthening disaster preparedness at the primary healthcare level.

Objectives of the Study

General Objective:

- To evaluate the effectiveness of a disaster management training module among ASHA workers.

Specific Objectives:

1. To assess pre-test knowledge regarding disaster management among ASHA workers.
2. To assess perceived readiness among ASHA workers.
3. To assess competence among ASHA workers.
4. To evaluate the effectiveness of the disaster management training module on knowledge, perceived readiness, and competence.
5. To determine the association between post-test scores and selected demographic variables.

6. To identify the correlation among knowledge, perceived readiness, and competence.

Methodology

A quantitative research approach with a quasi-experimental pre-test post-test control group design was adopted to evaluate the effectiveness of a disaster management training module on knowledge, perceived readiness, and competence among ASHA workers in selected Primary Health Centres (PHCs) and Community Health Centres (CHCs) of Gurugram, Haryana. The study was conducted among 120 ASHA workers selected through a non-probability purposive sampling technique and allocated into intervention (n=60) and control (n=60) groups. ASHA workers having a minimum of six months of work experience and willing to participate were included in the study, whereas those who had received prior formal disaster management training within the previous six months or were unavailable during the data collection period were excluded. Baseline data were collected using a structured demographic proforma, a validated knowledge questionnaire, a perceived readiness scale, and a competency assessment scale. Following the pre-test assessment, the intervention group received a structured disaster management training module developed based on literature review, national guidelines, and expert consultation. The training module included disaster concepts, disaster phases, preparedness measures, triage, first aid, communication strategies, and the roles and responsibilities of ASHA workers during disasters through lectures, demonstrations, group discussions, and simulation exercises. The control group received routine information without intervention. A post-test assessment was conducted four weeks after administration of the training module using the same tools. Content validity of the instruments was established through expert review, and reliability was assessed using Kuder–Richardson Formula (KR-20) and Cronbach's alpha coefficient with acceptable reliability values above 0.80. Ethical clearance was obtained from the Institutional Ethics Committee, and written informed consent was secured from all participants before data collection. The collected data were analysed using descriptive and inferential statistics including frequency, percentage, mean, standard deviation, paired t-test, independent t-test, chi-square test, and Pearson correlation coefficient. Statistical significance was considered at $p < 0.05$.

Results

A total of 120 ASHA workers participated in the study, with 60 participants in the intervention group and 60 in the control group. The majority of participants in both groups belonged to the age group of 31–40 years (46.7%), had completed secondary or higher secondary education (58.3%), and had work experience ranging from 5–10 years (52.5%). Approximately 68.3% of participants reported no previous formal training in disaster management. Baseline demographic characteristics between the intervention and control groups were comparable, and no statistically significant differences were observed ($p > 0.05$). Pre-test assessment revealed no statistically significant difference between the intervention and control groups in terms of mean knowledge scores (13.62±3.14 vs. 13.28±3.07; p=0.721), perceived readiness scores (21.74±4.28 vs. 22.11±4.09; p=0.684), and competence scores (18.25±3.87 vs. 18.54±3.92; p=0.763), indicating homogeneity of groups before implementation of the intervention. Following administration of the disaster management training module, a statistically significant improvement was observed in the intervention group across all outcome variables. The mean knowledge score increased from 13.62±3.14 during pre-test to 24.83±2.76 during post-test, demonstrating a mean difference of 11.21 points (t=21.84, p<0.001). Similarly, perceived readiness scores increased from 21.74±4.28 to 34.56±3.91 with a mean difference of 12.82 points (t=17.29, p<0.001). Competence scores also improved significantly from 18.25±3.87 to 31.42±4.11 with a mean difference of 13.17 points (t=18.63, p<0.001). In contrast, the control group demonstrated only minimal changes in post-test scores, with no statistically significant differences observed for knowledge (13.28±3.07 to 14.11±3.16; t=1.28, p=0.205), perceived readiness (22.11±4.09 to 22.84±4.14; t=1.04, p=0.302), or competence (18.54±3.92 to 19.17±4.01; t=0.97, p=0.337). Intergroup comparison of post-test scores using independent t-test demonstrated significantly higher mean scores in the intervention group than the control group for knowledge (t=18.76, p<0.001), perceived readiness (t=15.43, p<0.001), and competence (t=16.87, p<0.001). Correlation analysis revealed a moderate positive relationship between knowledge and competence scores (r=0.62, p<0.001), suggesting that improved knowledge was associated with increased competency. Additionally, a positive correlation was found between perceived readiness and competence scores (r=0.58, p<0.001).

The findings indicate that the disaster management training module was effective in significantly improving knowledge, perceived readiness, and competence among ASHA workers in selected PHCs and CHCs of Gurugram, Haryana. These findings support the utility of structured educational interventions for strengthening disaster preparedness among frontline healthcare workers.

Table 1: Comparison of Pre-test and Post-test Mean Scores among ASHA Workers in the Intervention Group (n=60)

Variables	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Difference	t-value	p-value
Knowledge	13.62 ± 3.14	24.83 ± 2.76	11.21	21.84	<0.001*
Perceived Readiness	21.74 ± 4.28	34.56 ± 3.91	12.82	17.29	<0.001*
Competence	18.25 ± 3.87	31.42 ± 4.11	13.17	18.63	<0.001*

*Significant at $p < 0.05$

Interpretation: The findings reveal a statistically significant improvement in knowledge, perceived readiness, and competence scores following implementation of the disaster management training module among ASHA workers.

Table 2: Comparison of Post-test Scores between Intervention and Control Group

Variables	Intervention Group Mean ± SD	Control Group Mean ± SD	t-value	p-value
Knowledge	24.83 ± 2.76	14.11 ± 3.16	18.76	<0.001*
Perceived Readiness	34.56 ± 3.91	22.84 ± 4.14	15.43	<0.001*
Competence	31.42 ± 4.11	19.17 ± 4.01	16.87	<0.001*

*Significant at $p < 0.05$

Comparison of Findings

The findings of the present study demonstrated that the disaster management training module significantly improved knowledge, perceived readiness, and competence among ASHA workers in selected PHCs and CHCs of Gurugram, Haryana. Similar findings have been reported in previous studies evaluating the effectiveness of structured training interventions among ASHA workers and frontline healthcare personnel. The present study showed a statistically significant improvement in knowledge scores after implementation of the disaster management training module, with mean scores increasing from **13.62±3.14** during pre-test to **24.83±2.76** during post-test (**t=21.84, p<0.001**). These findings are consistent with a quasi-experimental study conducted among ASHA workers in Delhi by Anu Gauba and colleagues, which reported a significant increase in post-test practice scores following a structured training programme on newborn care. The study concluded that educational interventions effectively improve ASHA workers' performance and knowledge. Similarly, a study conducted among ASHA workers in Tamil Nadu evaluating the impact of a maternal healthcare training programme reported substantial improvement in knowledge scores after structured training sessions. The authors emphasized that continuous training significantly enhances the capacity of ASHA workers in performing community healthcare responsibilities. The findings regarding competence improvement in the present study are also supported by research evaluating Home-Based Newborn Care (HBNC) training among ASHA workers in rural India. The study observed improvement in knowledge, practices, and attitudes following refresher training interventions and highlighted the importance of repeated educational reinforcement for improving field performance. The present study found significant enhancement in perceived readiness and competence following disaster management training. Comparable observations have been reported in studies assessing mental health training interventions among ASHA workers. A pilot study conducted in rural areas of Jabalpur reported significant improvements in knowledge, attitude, and practices after structured mental health training programmes among ASHA workers. Recent disaster preparedness initiatives have also highlighted the growing need for disaster-specific training among frontline healthcare workers. Specialized preparedness programmes for ASHA workers and paramedical staff have been initiated to improve awareness and emergency response capabilities, reinforcing the need for formal disaster preparedness education. Although most available studies focus on maternal care, newborn care, or mental health training, limited literature specifically addresses disaster preparedness among ASHA workers. Therefore, the present study contributes additional evidence by evaluating not only knowledge but also perceived readiness and competence in disaster management. Unlike previous studies, the present research assessed multidimensional outcomes using a structured disaster management training module among ASHA workers in Gurugram, Haryana.

Overall, the findings suggest consistency with previous evidence indicating that structured educational interventions significantly enhance frontline healthcare workers' preparedness and competencies. This supports the integration of disaster management training modules into routine capacity-building programmes for ASHA workers.

Discussion

The present study was conducted to evaluate the effectiveness of a disaster management training module on knowledge, perceived readiness, and competence among ASHA workers in selected PHCs and CHCs of Gurugram, Haryana. The findings demonstrated that the disaster management training module produced a statistically significant improvement in all study outcomes among

participants in the intervention group. The study highlights the importance of structured educational interventions in enhancing disaster preparedness among frontline community healthcare workers. In the present study, baseline findings indicated that both intervention and control groups were comparable before implementation of the training module, as no statistically significant differences were observed in pre-test knowledge, perceived readiness, and competence scores ($p > 0.05$). This homogeneity ensured that any changes observed in the post-test assessment could be attributed primarily to the intervention. The majority of ASHA workers had not received any previous formal disaster management training, indicating an existing gap in preparedness among frontline healthcare workers. Following implementation of the disaster management training module, the intervention group demonstrated a substantial increase in mean knowledge scores from **13.62±3.14** to **24.83±2.76** (**t=21.84, p<0.001**). These findings suggest that structured educational content delivered through lectures, demonstrations, discussions, and simulation exercises significantly enhanced participants' understanding of disaster concepts, preparedness strategies, triage, communication systems, and emergency response procedures. Similarly, perceived readiness scores improved significantly from **21.74±4.28** to **34.56±3.91** (**t=17.29, p<0.001**). This finding indicates that training not only improved factual knowledge but also enhanced confidence and preparedness to respond during emergencies. Disaster response requires healthcare workers to feel psychologically prepared and confident in performing assigned responsibilities. Improved perceived readiness may contribute to better community-level emergency response and resilience. Competence scores also showed significant improvement from **18.25±3.87** to **31.42±4.11** (**t=18.63, p<0.001**). Competence in disaster management includes decision-making ability, communication, first aid skills, coordination, and emergency response practices. The inclusion of simulation exercises and practical sessions within the training module may have contributed to improved competency among participants. The present findings are consistent with previous studies evaluating training interventions among ASHA workers and community healthcare personnel. Earlier studies have reported significant improvement in knowledge and performance after structured educational programs. Similar interventions involving simulation-based learning and practical demonstrations have shown positive effects on preparedness and competency outcomes. The findings also support evidence generated during recent public health emergencies, particularly during the COVID-19 pandemic, which emphasized the importance of strengthening frontline healthcare workers through regular training initiatives. The study further identified a moderate positive correlation between knowledge and competence (**r=0.62, p<0.001**) and between perceived readiness and competence (**r=0.58, p<0.001**). These findings indicate that increased knowledge and preparedness are associated with improved performance capabilities. Therefore, strengthening educational initiatives may have a direct influence on practical competencies during disaster situations.

Overall, the findings of the present study demonstrate that disaster management training is an effective strategy for improving preparedness among ASHA workers. Regular refresher training and integration of disaster preparedness modules into routine community health capacity-building programs may further strengthen disaster response systems at the primary healthcare level.

Conclusion

The present study concluded that the disaster management training module was effective in significantly improving knowledge, perceived readiness, and competence among ASHA workers in selected PHCs and CHCs of Gurugram, Haryana. Significant differences observed between pre-test and post-test scores indicate that structured educational interventions can positively influence disaster preparedness among frontline community healthcare workers. The findings emphasize the importance of strengthening the disaster response capabilities of ASHA workers through systematic and evidence-based training initiatives. ASHA workers serve as an essential link between healthcare systems and communities and are often among the first responders during public health emergencies and disasters. Therefore, enhancing their disaster preparedness through training programs can improve community resilience and healthcare response mechanisms. The study findings support incorporation of disaster management training modules into regular ASHA training curricula and continuing education programs. Future studies with larger sample sizes and diverse settings may further validate and strengthen the evidence regarding disaster preparedness interventions among frontline healthcare workers.

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