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Developing a Youth-Led Emergency Care Response System at the Community Level: An Implementation Study

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Abstract

Background: Emergencies and injuries are major contributors to mortality and disability in low- and middle-income countries, including India. Community-based first-responder systems can reduce preventable deaths, particularly when youth are trained to act in time-critical situations.

Objective: To evaluate the feasibility, effectiveness, and impact of the SATYAM (Student Augmented Training for Youth Amplification) program, a youth-led emergency care training initiative in Jaipur, Rajasthan.

Methods: A prospective interventional study was conducted from October 2024 to March 2025 across government colleges. Teachers and non-medical students received structured, two-day in-person training covering six modules on emergency recognition, response, and key life-saving skills (hands-only CPR, bleeding control, fracture management, Heimlich manoeuvre). A Training-of-Trainers model was used, where trained faculty cascaded knowledge to students. Knowledge and confidence were assessed via pre- and post-tests; participant feedback was collected.

Results: A total of 2,833 participants (362 teachers, 2,471 students) completed the program. Median knowledge scores improved significantly from 4 (IQR 3–6) pre-training to 7 (IQR 6–8) post-training ($p < 0.001$). Confidence in bleeding control increased from 31.6% to 78.7% reporting "Very Confident," and in chest compressions from 31.0% to 76.7%. Nearly 90% found the training useful for saving lives, and 85% would recommend it to others.

Conclusion: SATYAM demonstrates that youth-led, community-based emergency care training is feasible, scalable, and effective in improving knowledge, confidence, and readiness to act. Embedding such programs within institutional frameworks can strengthen community resilience, reduce preventable morbidity and mortality, and foster civic responsibility among young populations.

Introduction

Emergencies and injuries remain critical contributors to global mortality and disability, with low- and middle-income countries (LMICs) disproportionately affected, accounting for

nearly 90% of deaths and 85% of disabilities worldwide (World Health Organization [WHO], 2022). Within this context, emergency conditions in India, ranging from road traffic injuries to acute medical crises such as heart attacks and strokes, pose formidable public health challenges requiring urgent, coordinated responses.

In India, approximately 450,000 road traffic injuries are reported annually, resulting in nearly 150,000 deaths—predominantly among young and economically active individuals. In addition, India experiences an estimated 2.5 million heart attacks, 1.5 million snake bites, 26,000 poisonings, 140,000 suicides, and 3.5 million premature deliveries each year. Compounding this burden are 7 million cases of brain stroke and over 55 million chronic lung disease cases, many of which present as life-threatening emergencies (The Lancet, 2020; GBD 2019; Harvard Public Health, 2021).

Rajasthan, covering nearly 10% of India's geographical area and home to only 6–7% of its population, accounts for approximately 5.2% of national road traffic fatalities. Jaipur ranks second among Indian cities with over one million residents in accident-related deaths. In 2022 alone, the state reported over 4,700 two-wheeler rider fatalities, constituting nearly 44.5% of its total road traffic deaths, underscoring critical gaps in emergency care infrastructure and first-responder readiness (Ministry of Road Transport & Highways, 2023), and with an equal burden of deaths and disabilities from medical emergency conditions.

These overlapping burdens highlight the urgent necessity of scalable, community-centred first-response systems that can ensure early recognition, stabilization, and rapid referral during critical emergencies. The time-sensitive nature of trauma, cardiovascular crises, and other acute medical events further amplifies the importance of community response in a timely manner to strengthen the national healthcare landscape.

Acute injuries and illnesses are time-critical threats to LMICs, where emergency care systems are fragmented and prehospital care is often scarce, leading to preventable deaths and disabilities.
Globally, community-based first-responder models—such as South Africa's Emergency First Aid Responder (EFAR) system and the U.S. "Stop the Bleed" campaign—demonstrate that training laypersons in basic lifesaving skills (e.g., hemorrhage control, CPR) is feasible, scalable, and effective. Meanwhile, WHO's Basic Emergency Care (BEC) programs and triage protocols in LMICs significantly reduce inpatient mortality.

In India, approximately 7–10% of the student population represents a structured, receptive group that can be developed into a valuable human resource. Training these students as community first-aid responders could lay the foundation for a fast and effective emergency response system in the future.

India's National Education Policy (NEP) 2020 emphasizes life skills—such as first aid and emergency preparedness—making students potential first-responder candidates. Given India's vast population (1.4 billion) and the significant proportion of students within this demographic, structured and scalable training programs like SATYAM could transform youth into effective community responders. Legal enablers—such as Good Samaritan protections and reward systems reinforce bystander activation and emergency assistance.

These findings unequivocally support the strategic value of community-anchored emergency initiatives.

About SATYAM Program

A prospective Interventional Study designed and named SATYAM – *Student Augmented Training for Youth Amplification*. This study was conducted in the Government Colleges, Jaipur, Rajasthan, from Oct 2024 to March 2025. This study was conducted by the WHO Collaborating Centre for Emergency & Trauma care, in collaboration with the Commissionerate of Higher Education, Jaipur, Rajasthan, funded by the Department of Transport & Road Safety, Government of Rajasthan. The targeted populations were teachers and students (non-medical) from different fields, such as undergraduate, graduate, and postgraduate. Inclusion criteria: Teachers & Students willing to participate in this study. Exclusion criteria: Teachers & Students who were unavailable at the time of the training.

The structured content was developed through a series of consultations with various stakeholders, such as experts from emergency care, clinical, public health, educationists, and students, with team members having previous experience of a similar kind. This 2-day in-person training program is designed to impart essential knowledge and skills to recognize and respond to common emergencies effectively at the community level by the students. Six modules were designed i) basic Principles of Emergencies; ii) Time Sensitive Emergencies; iii) Common Emergencies; iv) External Environment Emergencies; v) Lifestyle Emergencies – Hypertension, Diabetes; vi) Law and Orders with skills for Hands only CPR, Tourniquet application to control bleeding, fracture care using splinting, and Heimlich Manoeuvre in choking. The training program is human-centric, involves sensitisation and motivation to help others and to inculcate the spirit of a Good Samaritan.

Ethics

Ethical clearance from Ethical Committee with Reference no: AIIMSA00763/02.02.2024, RP – 50/2024

Methodology

A prospective interventional study titled SATYAM – Student Augmented Training for Youth Amplification was conducted in government colleges of Jaipur, Rajasthan, from October 2024 to March 2025. The study was carried out by the WHO Collaborating Centre for Emergency & Trauma Care in collaboration with the Commissionerate of Higher Education, Jaipur, and was funded by the Department of Transport & Road Safety, Government of Rajasthan. The target population included teachers and non-medical students from undergraduate, graduate, and postgraduate levels. Teachers and students willing to participate were included in the study, while those unavailable at the time of training were excluded.

The structured training content was developed through a series of consultations with experts in emergency care, clinical medicine, public health, educationists, and students, while also drawing upon the research team's prior experience with similar initiatives. The two-day in-person training program was designed to equip participants with essential knowledge and practical skills required to recognize and respond effectively to common community-level

emergencies. The curriculum was organized into six modules: Basic Principles of Emergencies, Time-Sensitive Emergencies, Common Emergencies, External Environment Emergencies, Lifestyle Emergencies (Hypertension, Diabetes), and Law and Order. Alongside theoretical knowledge, participants were trained in key life-saving skills such as hands-only CPR, tourniquet application for bleeding control, fracture management with splinting, and the Heimlich manoeuvre for choking. The program emphasized a human-centric approach, focusing not only on technical expertise but also on sensitization, motivation to help others, and fostering the spirit of being a Good Samaritan.

Execution of the Program: Training Implementation

To ensure effective implementation of the SATYAM Training Program, a Project Coordinator was appointed to oversee all activities, including training management, documentation, and coordination among stakeholders. A pool of Master Trainers—comprising emergency doctors, nurses, and public health professionals with prior teaching experience—was identified and trained on SATYAM modules. After certification, these Master Trainers were eligible to train college teachers under the program.

The training content was delivered through interactive methods such as PowerPoint presentations, videos, live demonstrations, and hands-on practice at skill stations. In total, 10 Training of Trainers (ToT) programs, each of two days' duration, were successfully conducted in a phased manner across government colleges in Jaipur.

On Day 1, the Provider Course for Teachers was conducted by four Master Trainers in a three-hour session. The course included lectures, discussions, interactive quizzes, and skills practice. This was followed by a two-hour Instructor Course, aimed at preparing teachers to become future trainers for their students. The session featured motivational talks on community emergency response, orientation on training design and objectives, guidance on setting up skill stations and delivery methods, as well as group activities on preparedness and planning.

Ten colleges were designated as nodal centers, where teachers from other colleges were invited to receive training. These trained teachers then conducted sessions for students the next day, under the supervision of Master Trainers. Their performance was assessed, and structured feedback was provided. Through this Training-of-Trainers (ToT) model, teachers from 33 colleges were trained, and students from 10 nodal colleges participated in the program.

On Day 2, the Provider Course for Students was conducted by the trained teachers under supervision from Master Trainers. Students received the same structured content as their teachers, while the performance of teachers during delivery was assessed to ensure quality, consistency, and readiness to independently conduct future training.

Data Collection and Analysis

Data Collection: A structured methodology was developed to collect data from all participants. Information was gathered through online Google Forms and stored in Excel sheets. Separate datasets were maintained for teachers and students, and analysis was carried out using IBM SPSS Statistics (Version 27) and Microsoft Excel (2016). The baseline data included demographic details, along with seven knowledge-based and three skill-related

multiple-choice questions. Post-test assessments and feedback provided insights into participants' knowledge gain, improvement in self-confidence, and perceptions of the course. All responses were collected through Google Forms and exported into Excel spreadsheets for systematic analysis.

Data analysis: The collected data were first coded and compiled into a master sheet. Analysis was carried out using IBM SPSS Statistics (Version 27) and Microsoft Excel (2016). Duplicate entries were identified and removed based on participants' names, genders, departments, colleges, and phone numbers. Descriptive statistics were applied to interpret the data. The normality of the dataset was tested using the Shapiro–Wilk test (SW). Since the pre- and post-training questionnaire scores did not follow a normal distribution, results were expressed as median with interquartile range (IQR). The Mann–Whitney test was used to determine statistical significance.

Findings

A total of 2,833 participants were trained under the program. Of these, 362 (12.7%) were faculty members representing 33 colleges through the *hub-and-spoke* model, while 2,471 (87.2%) were students from 10 nodal colleges. *Table 1 presents the demographic characteristics of the participants.*

Among teachers, 58.8% were male and 41.1% were female, with the majority falling within the 45–60 years age group (47.7%). A significant proportion reported having higher education qualifications (65.7%). Among students, 47.1% were male and 52.8% were female, with the vast majority being undergraduates (90%), predominantly within the 15–24 years age range (71.3%).

Table 1: Demographic Details of Participants

Variable	Overall (n=2833, 100%)	Teachers (n=362, 100%)	Students (n=2471, 100%)
Gender			
Male	1378 (48.6%)	213 (58.8%)	1165 (47.1%)
Female	1455 (51.3%)	149 (41.1%)	1306 (52.8%)
Age (in years)			
15-24	1770 (62.4%)	7 (1.9%)	1763 (71.3%)
25-34	740 (26%)	76 (20.9%)	664 (26.8%)
35-44	143 (5%)	104 (28.7%)	39 (1.5%)
45-60	178 (6.2%)	173 (47.7%)	5 (0.2%)
>60	2 (0.07%)	2 (0.5%)	0 (0%)
Education			
Undergraduate	2227 (78.6%)	0 (0%)	2227(90%)
Graduate	245 (8.6%)	11 (3%)	234 (9.4%)
Post Graduate	123 (4.3%)	113 (31.2%)	10 (0.4%)
Higher	238 (8.4%)	238 (65.7%)	0 (0%)

- Undergraduate – Pursuing Bachelor's;
- Graduate – Completed Bachelor's;
- Post Graduate – Pursuing/Completed Master's;
- Higher – Above Master's.

The response rates for the pre-test and post-test were 72% and 62%, respectively. Assessment of data normality using the Shapiro–Wilk test indicated a non-normal distribution ($p < 0.001$); hence, non-parametric statistical methods were employed for analysis.
Overall, there was a statistically significant improvement in knowledge scores from pre- to post-test. The median score increased from 4 (IQR: 3–6) in the pre-test to 7 (IQR: 6–8) in the post-test ($p < 0.001$).

Subgroup analysis demonstrated a similar pattern of improvement. Among teachers, the median score improved from 5 (IQR: 4–7) at baseline to 8 (IQR: 6–8) after training ($p < 0.001$). Among students, scores increased from 4 (IQR: 3–6) in the pre-test to 7 (IQR: 4–8) in the post-test ($p < 0.001$).

Confidence Improvement

There was a significant improvement in confidence levels for life-saving skills such as **Bleeding Control** and **Chest Compressions** following the training.

- **Graph 1 (Bleeding Control):** The percentage of participants who felt *"Very Confident"* increased from **31.6% to 78.7%**, while those who reported being *"Not Confident"* dropped from **13.3% to 1.4%**.
- **Graph 2 (Hands-only CPR – Chest Compressions):** *"Very Confident"* responses rose from **31.0% to 76.7%**, and *"Not Confident"* responses declined from **24.3% to 1.9%**.

These changes reflect a **marked improvement in self-reported confidence levels** after the training.

Feedback

- "This type of seminar is very helpful for a human being to save a life."
- "I was very glad and blissful after taking this session; it enhanced my knowledge and confidence."
- "People became aware about road traffic accidents, CPR, and daily lifestyle routine."
- "It's very important and helpful information for us. Now we are able to understand and make sure we can give help to people who need it."

Overall Perception

- **90%** of participants liked the training session and found it useful in saving lives during emergencies.
- **85%** said they would recommend others to attend this training.

Discussion

The findings from the SATYAM program underscore the feasibility, acceptability, and effectiveness of structured first-response training for non-medical teachers and students within higher education institutions. The significant improvement in knowledge scores across both groups highlights the potential of youth-centered interventions to address systemic gaps in prehospital emergency care in low- and middle-income country (LMIC) contexts. The results demonstrate that when empowered with essential skills such as cardiopulmonary resuscitation (CPR), bleeding control, and fracture management, students and teachers can serve as critical first responders during life-threatening emergencies within their communities.

This study demonstrates that youth-led emergency care training at the community level is feasible and effective. Knowledge scores improved significantly from pre- to post-test, showing that short, structured training can enhance emergency preparedness. Confidence in life-saving skills also increased markedly: *"Very Confident"* responses rose from 31.6% to 78.7% for bleeding control and from 31.0% to 76.7% for chest compressions, while *"Not Confident"* responses dropped to minimal levels. This indicates both skill acquisition and improved self-efficacy.

Participant feedback reinforced the program's value, with nearly 90% finding it useful for saving lives and 85% willing to recommend it to others.

Overall, youth-led community training can strengthen knowledge, confidence, and readiness to act—key factors for improving community resilience and reducing preventable injuries and deaths.

The hub-and-spoke model employed in this study proved particularly effective for large-scale dissemination. By training faculty as trainers and leveraging them to cascade knowledge and skills to students, SATYAM not only ensured scalability but also embedded sustainability into the system. The active participation of teachers, who are trusted community anchors, further enhanced the program's credibility and fostered intergenerational knowledge transfer.

Globally, similar community-based emergency initiatives have shown measurable impact in reducing mortality and morbidity by bridging the "first few minutes gap" before professional medical services arrive. The SATYAM findings align with international evidence—such as the Emergency First Aid Responder (EFAR) system in South Africa and WHO's Basic Emergency Care (BEC) training—that equipping laypersons with targeted, context-appropriate skills can save lives. Importantly, SATYAM demonstrates how such models can be contextualized for India's higher education ecosystem by aligning with the National Education Policy (NEP) 2020, which emphasizes the integration of life skills and community service into curricula.

From a social innovation perspective, the SATYAM program contributes more than technical training—it cultivates empathy, civic responsibility, and altruism among youth. By embedding Good Samaritan principles and sensitizing participants to their role in safeguarding lives, SATYAM transforms students from passive learners into proactive agents of community resilience. This human-centric approach expands the definition of education

from a knowledge-transfer process to a mechanism of societal transformation, where every trained student becomes both a potential lifesaver and a role model for civic engagement.

The study also highlights important policy-level implications. The program's overwhelming acceptance by students, faculty, and administrators suggests strong potential for institutionalization. Aligning SATYAM with existing state-level frameworks such as Rajasthan's *Anandam Program* (Joy of Giving) and national platforms like the National Service Scheme (NSS) and the National Cadet Corps (NCC) would not only expand its reach but also embed lifesaving skills into the identity of Indian youth. Such integration ensures sustainability, prevents duplication of efforts, and creates a scalable model adaptable across states and institutions.

Finally, while the results are encouraging, future research should assess the long-term retention of knowledge and skills, evaluate real-world applications of training in community emergencies, and explore digital or blended approaches to scale capacity building. Further integration of SATYAM within other public health programs and community outreach efforts could also extend its impact beyond academic institutions, creating a culture of preparedness and collective responsibility.

Policy Recommendation

The overwhelming support from college administrations, teachers, students, and the State Education Department demonstrates the success and sustainability of this initiative. The request and process of including the SATYAM Program as a credited course in the Rajasthan state-run initiative—the Anandam Program (Joy of Giving), launched by the Higher and Technical Education (HTE) Department, Rajasthan—is currently proposed. The Anandam Program is aimed at fostering empathy, social responsibility, and community service among students, highlighting that true fulfillment (Anandam) comes not from material gains but from acts of kindness and giving. Under this framework, students—individually or in groups—undertake structured, faculty-guided community projects, making altruism and social contribution an integral part of their academic journey.

At the national level, the proposal also envisions integrating the SATYAM Program into the National Service Scheme (NSS) and the National Cadet Corps (NCC). Embedding SATYAM within these frameworks, where structured community service and discipline-based activities already exist, would further strengthen youth engagement, empathy, and resilience-building across India.

Conclusion

The SATYAM initiative demonstrates that equipping teachers and students with lifesaving knowledge and first-response skills is both feasible and impactful in strengthening community resilience. With over 2,800 participants trained across 33 government colleges in Rajasthan, the program has proven its scalability, acceptability, and alignment with India's National Education Policy (NEP) 2020 and Good Samaritan framework. Importantly, it bridges a critical gap in prehospital emergency care by mobilizing youth—a structured and receptive demographic—into an empowered, community-based first-responder force.

By embedding SATYAM into institutional frameworks such as Rajasthan's Anandam Program (Joy of Giving) under the Higher and Technical Education (HTE) Department, and proposing its integration into the National Service Scheme (NSS) and the National Cadet Corps (NCC) at the national level, the program has the potential to catalyze a paradigm shift in India's emergency preparedness. This approach ensures that lifesaving skills are not confined to healthcare professionals but become a shared civic responsibility embedded in education, service, and citizenship.

Scaling SATYAM across states and integrating it into national youth platforms would not only save countless lives from preventable deaths and disabilities but also nurture a generation of socially responsible, empathetic, and resilient citizens. In doing so, India can set a global benchmark for community-driven emergency response in low- and middle-income country (LMIC) contexts—where timely action often makes the difference between life and death.

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