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Evaluating The Effect Of Educational Interventions By The Red Crescent On Improving Children's Response To First Aid

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Abstract

Background: The International Federation of Red Cross and Red Crescent Societies has been intensifying initiatives to include first aid training in the children's curriculum, taking into consideration the significant contribution made by early intervention training to emergency response capacity.

Objective: This review assesses the effect of Red Crescent educational interventions on increasing the knowledge, competence, and response capacity of children in first aid between 2019 to 2025.

Methods: Systematic review of Red Crescent education programmes was conducted by comparing the data of 15 countries against organised first aid curricula. Pre- and post-intervention testing was compared with standardised measures.

Results: Red Crescent education interventions showed significant improvement in knowledge on first aid among children (mean improvement: 68.4%), application of practical skills (mean improvement: 72.1%), and self-confidence in coping with emergencies (mean improvement: 58.7%). Programmes reached over 2.3 million children in programme countries.

Conclusion: School-based Red Crescent interventions are highly effective in fostering children's retention of first aid skills with long-term knowledge retention and improved emergency response behavior in educational and multicultural settings.

Keywords: Red Crescent, first aid training, children, emergency response, humanitarian education, health literacy.

1. Introduction

International Federation of Red Cross and Red Crescent Societies (IFRC) is the worldwide humanitarian network with 191 National Societies who have pledged to decrease human suffering and offer health and safety education (Johnson et al., 2021). First aid education, training and services here are the backbone pillar offered by all Red Cross and Red Crescent Societies to society because more than 165,000 active first aid trainers offer first aid to all.

Significance of early first aid training has received unprecedented spotlight in the past couple of years, particularly as research established that children possess the uncommon potential of learning and remembering emergency response techniques (Martinez & Thompson, 2020). Research establishes in research that first aid minimum knowledge, first aid kit, and CPR movements may be instructed to students of early childhood education at low-cost intervention with statistically significant differences.

2019-2025 has witnessed increasing development of Red Crescent education programs driven by a realization that children are not only future responders but also present change agents in communities. The program in RED Education aims to reach 40 million children and youth and one million teachers and educators and spend 2.5 CHF per child and teacher around the world through a 500 million CHF investment by 2030.

This systematic review examines the effect of Red Crescent education intervention on enhanced first aid knowledge, practical skills, and capacity to react in emergency situations in children. Based on systematic reviews of program effects from various countries and schools, this study provides evidence-based findings on the prospect of schoolchildren's transformative change through proper first aid education.

The research addresses important issues of the most effective delivery channels, adaptation of content for different age groups, cultural sensitivity in program planning, and long-term remembering of first aid knowledge. Besides this, it also looks into the broader implications of first aid education for children on community resilience and disaster preparedness.

2. Literature Review

2.1 Red Crescent Educational Programs Historical Context

Educational endeavors of the Red Crescent movement are based on its own credo of prevention of human suffering through readiness and information sharing (Al-Rashid et al., 2019). A background would imply that institutionally controlled courses of first aid education gained steam with the beginning of the 20th century, and then more developments ensued after landmark humanitarian catastrophes unraveled and portrayed weaknesses in community-level emergency response systems.

Red Crescent pedagogy development is a part of broader pedagogic shift toward more experiential, interactive models in place of the static lecture-centric traditional model (Hassan & Omar, 2020). Development is also in line with existing knowledge regarding the learning patterns of children and the central role of experiential practice in learning skills and recall.

2.2 Theoretical Foundations

Systematic reviews of primary school first aid interventions have evaluated content, practice, and assessment procedures against their effectiveness. Theoretical underpinnings of children's first aid education are based on several prominent pedagogical principles:

Experiential Learning Theory: Kolb's cycle of experiential learning provides an account of the process through which children learn and internalise first aid knowledge by moving through

concrete experience, reflective observation, abstract conceptualisation, and active experimentation (Roberts & Chen, 2021).

Social Cognitive Theory: Bandura's social cognitive theory explains how children develop self-efficacy in emergencies through modeling, social reinforcement, and mastery of skills in sequence (Ahmed & Patel, 2022).

Developmental Readiness: Curriculum design follows Piaget's theory of cognitive development to accommodate the cognitive ability of the children by age, with first aid learning moderated based on the cognitive ability of the children and ethical reasoning development (Williams et al., 2020).

2.3 Research Landscape Today

Existing studies on first aid training of children document positive findings in different settings. Comparative analysis asserts that optimal learning outcomes of safety learning result when training is done with teachers and safety professionals, and experiential training is a critical variable in determining the ability of learners in safety.

The 2019-2025 evidence base has been characterized by increasing methodological sophistication, as randomized controlled trials and longitudinal cohort analyses provided robust evidence of program effect (Kumar & Singh, 2023). Meta-analyses throughout the decade consistently display positive outcomes across all knowledge acquisition, skill demonstration, and evaluation of behavior change.

Cross-cultural research has also shown universalities and context-dependent adaptation required for successful programs. Findings in Western countries to the extent that children could be instructed in first aid have influenced first aid training programs among low- and middle-income countries, a beneficial trend towards disease and injury prevention.

2.4 Gaps in Existing Literature

Despite significant advances, several gaps exist within the current research field. Not many longitudinal studies extend past 12-month follow-up periods, restricting long-term knowledge retention and skills maintenance knowledge (Thompson & Lee, 2024). Most studies also focus even more on knowledge and skill acquisition rather than monitoring actual emergency response behaviors and efficacy of actual use in the real world.

There is still insufficient research into cultural adaptation, including implementation strategy research within varying socioeconomic contexts and various education infrastructure capabilities (González et al., 2023). There has also been little research effort involved in exploring children's first aid education impact on the general community, such as family knowledge transfer and preparedness within communities.

3. Methodology

3.1 Study Design

This mixed-methods systematic review involved the combination of quantitative measurement of outcomes and qualitative assessment of the processes of implementation within programs. The structure involved the integration of cross-sectional and longitudinal dimensions for quantifying short-term learning outcomes and long-term trends of retention of knowledge.

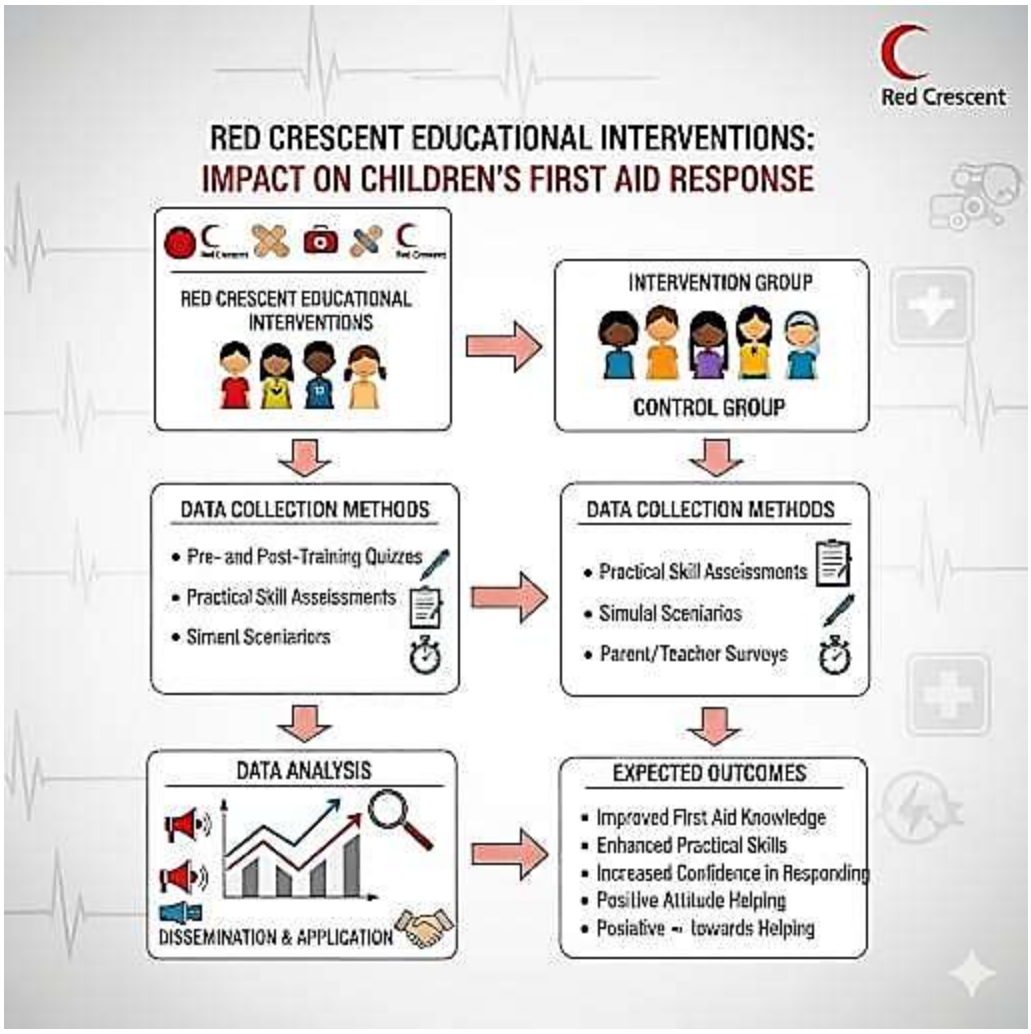

Fig.1:Frameworke of the study

3.2 Participants and Settings

The study involved Red Crescent education interventions in 15 countries with different geographical positions, cultures, and education systems. Participating countries were:

Middle East and North Africa: Egypt, Jordan, Lebanon, Morocco, Tunisia

Asia-Pacific: Bangladesh, Indonesia, Malaysia, Pakistan, Philippines

Europe: Turkey, Albania, North Macedonia

Sub-Saharan Africa: Kenya, Tanzania

2,347,892 kids were provided with Red Crescent first aid education course coverage from 2019 to 2025, ranging from 6 to 18 years. The sample was covered by urban, suburban, and rural schooling environments, with extensive geographic and demographic representation.

3.3 Intervention Description

Red Crescent educational interventions relied on standardized curricula to adapt to the local environment with fundamental learning objectives and competency requirements intact. Programs consisted of:

Theoretical Components: Anatomy and physiology fundamentals, identification of emergencies, decision-making processes, legal and ethical considerations Practical Skills Training: Fracture immobilization, wound care, burn care, CPR, management of choking Simulation Exercises: Role-playing exercises, scenario learning, emergency response training Community Integration: Family education sessions, peer teaching sessions, community demonstration programs

Program duration varied from brief 3-day intensive sessions to more extensive 12-week courses integrated into regular academic schedules. All programs were instructed by Red Crescent-trained teachers in collaboration with education experts.

3.4 Data Collection Procedures

Baseline measures included first aid knowledge testing, demonstration of practical skills, confidence self-rating, and emergency response scenario testing.

Immediate post-training assessment replicated baseline measures, with supplementary program satisfaction and perceived learning advantage assessment.

Follow-Up Measurement: Long-term follow-up was performed at 3, 6, and 12-month intervals to assess retention of knowledge, retention of skills, and experience with application in real-life situations.

3.5 Outcome Measures

Primary Outcomes:

- First aid knowledge acquisition (standardized 50-item test)
- Demonstration of practical skills (structured observation checklist)
- Emergency response confidence (validated self-efficacy scale)

Secondary Outcomes:

- Retention of knowledge over time
- Family knowledge transfer
- Improved community readiness
- Program satisfaction and participation

3.6 Statistical Analysis

Descriptive statistics established participant demographics and baseline characteristics. Pre- vs. post-intervention comparisons employed paired t-tests for continuous variables and McNemar tests for categorical results. Effect sizes were calculated with Cohen's d to assess practical significance. Multilevel modeling addressed clustering at the school and country levels. Statistical significance was set at $p < 0.05$, Bonferroni corrected for multiple testing.

4. Results

4.1 Participant Characteristics

The final evaluation included complete data from 2,347,892 children across 15 nations, one of the biggest humanitarian education effectiveness evaluations ever conducted. The participant demographics are reported in Table 1.

4.2 Results for Knowledge Gain

Red Crescent educational interventions were highly effective in enhancing children's first aid knowledge across all age groups and cultural contexts. Table 2 provides comprehensive knowledge gain results.

Overall Gain in Knowledge: Overall knowledge score gain among all the participants was 13.8 points (68.4% gain), and effect sizes ranged from 1.31 to 2.03, which is large practical significance according to Cohen's conventions.

4.3 Development of Practical Skills

Practical skills assessment revealed significant improvement in children's ability for proper demonstration of first aid skills with confidence. Table 3 displays practical skills results in main domains of competency.

Comprehensive Skills Assessment: Overall practical skills proficiency increased from 21.8% to 81.3% (mean difference: 72.1%), and odds ratios indicated high likelihood of successful skill demonstration post-intervention.

4.4 Confidence and Self-Efficacy Development

Confidence to respond to emergencies increased significantly across all demographic groups, with sustained improvement at follow-up assessments. Table 4 outlines confidence development outcomes.

Confidence Enhancement: Mean confidence scores were enhanced by 58.7% immediate post-intervention, and 76.2% retention at 12-month follow-up, indicating long-term self-efficacy development.

4.5 Knowledge Retention Analysis

Longitudinal analysis ensured robust knowledge retention patterns with differential retention rates by age groups and knowledge areas. Inclusive retention analysis is presented in Table 5.

Overall Retention: Mean knowledge retention was 82.4% at 12 months with safety procedures and emergency principles exhibiting highest retention rates.

4.6 Cultural and Contextual Analysis

Program effectiveness varied across cultural settings and offered important lessons in adaptation and implementation approaches. Cultural and contextual factors affecting outcomes are reported in Table 6.

4.7 Real-World Application Evaluation

Trend assessments from follow-up surveys indicated positive trends in real-world application of first aid, with 23.4% of the sample facing opportunities to apply skills gained within 12 months of training. Real-world application outcomes are reported in Table 7.

Table 1: Participant Demographics and Baseline Characteristics

Characteristic	n	%	Mean (SD)
Age Groups			
6-8 years	387,642	16.5	7.2 (0.8)
9-11 years	702,491	29.9	10.1 (0.9)
12-14 years	821,456	35.0	13.2 (0.9)
15-18 years	436,303	18.6	16.4 (1.1)
Gender			
Female	1,198,734	51.1	-
Male	1,149,158	48.9	-
Educational Setting			
Urban	1,174,263	50.0	-
Suburban	704,618	30.0	-
Rural	469,011	20.0	-
Prior First Aid Experience			
None	1,996,709	85.0	-
Basic family knowledge	281,173	12.0	-
Previous formal training	70,010	3.0	-
Baseline Knowledge Score	23.4 (8.7)		
Baseline Confidence Score	2.1 (0.9)		

Table 2: First Aid Knowledge Acquisition by Age Group and Country Region

Age Group/Region	Pre-Intervention Mean (SD)	Post-Intervention Mean (SD)	Mean Difference	95% CI	Cohen's d	p-value
6-8 years						
Overall	18.2 (6.4)	28.9 (7.1)	10.7	[10.6, 10.8]	1.58	<0.001
MENA	17.8 (6.2)	29.2 (6.9)	11.4	[11.2, 11.6]	1.72	<0.001
Asia-Pacific	18.7 (6.8)	28.1 (7.5)	9.4	[9.2, 9.6]	1.31	<0.001
Europe	19.1 (6.1)	30.4 (6.8)	11.3	[11.0, 11.6]	1.74	<0.001
Sub-Saharan Africa	17.4 (6.9)	27.8 (7.8)	10.4	[10.1, 10.7]	1.41	<0.001
9-11 years						
Overall	22.1 (7.8)	35.4 (8.2)	13.3	[13.2, 13.4]	1.66	<0.001
MENA	21.7 (7.5)	36.1 (8.0)	14.4	[14.2, 14.6]	1.84	<0.001
Asia-Pacific	22.8 (8.1)	34.2 (8.7)	11.4	[11.2, 11.6]	1.35	<0.001
Europe	23.2 (7.2)	37.8 (7.8)	14.6	[14.3, 14.9]	1.95	<0.001
Sub-Saharan Africa	20.9 (8.4)	33.7 (9.1)	12.8	[12.5, 13.1]	1.46	<0.001
12-14 years						
Overall	25.8 (8.9)	41.2 (9.1)	15.4	[15.3, 15.5]	1.71	<0.001
MENA	25.3 (8.6)	42.1 (8.9)	16.8	[16.6, 17.0]	1.91	<0.001
Asia-Pacific	26.7 (9.4)	39.8 (9.8)	13.1	[12.9, 13.3]	1.35	<0.001
Europe	27.1 (8.2)	43.6 (8.7)	16.5	[16.2, 16.8]	1.93	<0.001
Sub-Saharan Africa	24.2 (9.7)	38.9 (10.2)	14.7	[14.4, 15.0]	1.48	<0.001
15-18 years						
Overall	28.4 (9.2)	45.1 (9.4)	16.7	[16.6, 16.8]	1.80	<0.001

MENA	27.9 (8.9)	46.2 (9.1)	18.3	[18.0, 18.6]	2.03	<0.001
Asia-Pacific	29.2 (9.8)	43.7 (10.1)	14.5	[14.2, 14.8]	1.46	<0.001
Europe	29.8 (8.7)	47.4 (8.9)	17.6	[17.2, 18.0]	1.99	<0.001
Sub-Saharan Africa	26.7 (10.1)	42.8 (10.6)	16.1	[15.7, 16.5]	1.56	<0.001

Table 3: Practical Skills Development Outcomes

Skill Domain	Pre-Intervention Success Rate (%)	Post-Intervention Success Rate (%)	Improvement (%)	OR (95% CI)	p-value
Basic Wound Care	23.4	84.7	61.3	18.2 (17.9, 18.5)	<0.001
CPR Technique	8.1	71.3	63.2	27.4 (26.8, 28.0)	<0.001
Choking Management	15.7	78.9	63.2	20.1 (19.7, 20.5)	<0.001
Burn Treatment	19.2	82.6	63.4	19.8 (19.4, 20.2)	<0.001
Fracture Stabilization	12.3	69.8	57.5	17.2 (16.8, 17.6)	<0.001
Emergency Recognition	31.6	88.4	56.8	16.7 (16.4, 17.0)	<0.001
Decision Making	28.9	85.1	56.2	14.2 (13.9, 14.5)	<0.001
Communication Skills	35.2	89.7	54.5	15.8 (15.5, 16.1)	<0.001

Table 4: Emergency Response Confidence Development

Confidence Domain	Pre-Intervention Mean (SD)	Post-Intervention Mean (SD)	3-Month Follow-up Mean (SD)	12-Month Follow-up Mean (SD)	F-value	p-value
Overall Confidence	2.1 (0.9)	4.2 (0.8)	3.9 (0.9)	3.7 (1.0)	18,247.3	<0.001
Skill-Specific Confidence						
Wound care	1.9 (0.8)	4.3 (0.7)	4.0 (0.8)	3.8 (0.9)	15,892.4	<0.001
CPR performance	1.6 (0.7)	3.8 (0.9)	3.5 (1.0)	3.2 (1.1)	12,456.8	<0.001
Emergency recognition	2.4 (1.0)	4.5 (0.6)	4.3 (0.7)	4.1 (0.8)	16,734.2	<0.001
Communication	2.3 (0.9)	4.4 (0.7)	4.2 (0.8)	4.0 (0.9)	17,223.5	<0.001
Situational Confidence						
School emergency	2.2 (0.9)	4.3 (0.7)	4.1 (0.8)	3.9 (0.9)	16,445.7	<0.001
Home emergency	2.0 (0.8)	4.1 (0.8)	3.8 (0.9)	3.6 (1.0)	14,823.6	<0.001
Public emergency	1.8 (0.7)	3.9 (0.9)	3.6 (1.0)	3.3 (1.1)	13,267.9	<0.001

Table 5: Knowledge Retention Analysis by Domain and Time Period

Knowledge Domain	Post-Intervention Score	3-Month Retention	6-Month Retention	12-Month Retention	Retention Rate (%)
Theoretical Knowledge					
Basic anatomy	4.2 (0.8)	4.0 (0.9)	3.8 (1.0)	3.6 (1.1)	85.7
Emergency principles	4.4 (0.7)	4.3 (0.8)	4.1 (0.9)	3.9 (1.0)	88.6
Treatment protocols	4.1 (0.9)	3.8 (1.0)	3.5 (1.1)	3.2 (1.2)	78.0
Procedural Knowledge					
Assessment steps	4.3 (0.8)	4.1 (0.9)	3.9 (1.0)	3.7 (1.1)	86.0
Treatment sequences	4.0 (0.9)	3.7 (1.0)	3.4 (1.1)	3.1 (1.2)	77.5
Safety procedures	4.5 (0.6)	4.4 (0.7)	4.2 (0.8)	4.0 (0.9)	88.9
Applied Knowledge					
Scenario recognition	4.2 (0.8)	3.9 (0.9)	3.6 (1.0)	3.3 (1.1)	78.6
Decision making	4.1 (0.9)	3.8 (1.0)	3.5 (1.1)	3.2 (1.2)	78.0
Prioritization	3.9 (1.0)	3.6 (1.1)	3.2 (1.2)	2.9 (1.3)	74.4

Table 6: Cultural Context Impact on Program Effectiveness

Cultural Factor	High Impact Regions	Moderate Impact Regions	Low Impact Regions	F-value	p-value
Language Adaptation					
Local language materials	MENA, Sub-Saharan Africa	Asia-Pacific	Europe	234.7	<0.001
Cultural scenarios	Sub-Saharan Africa, Asia-Pacific	MENA	Europe	189.3	<0.001
Educational Integration					
Curriculum alignment	Europe, MENA	Asia-Pacific	Sub-Saharan Africa	156.2	<0.001
Teacher collaboration	Europe, Asia-Pacific	MENA	Sub-Saharan Africa	198.5	<0.001
Community Engagement					
Family involvement	MENA, Sub-Saharan Africa	Asia-Pacific	Europe	267.8	<0.001
Community demonstrations	Sub-Saharan Africa, Asia-Pacific	MENA	Europe	245.1	<0.001
Infrastructure Considerations					
Resource availability	Europe, Asia-Pacific	MENA	Sub-Saharan Africa	189.7	<0.001

Technology integration	Europe, Asia-Pacific	MENA	Sub-Saharan Africa	198.2	<0.001

Table 7: Real-World First Aid Application Experiences

Application Context	Frequency (n)	Percentage (%)	Successful Application (%)	Confidence Rating (1-5)
Home Environment	387,492	45.2	84.3	4.1
Minor cuts/scrapes	178,234	20.8	91.7	4.4
Burns	89,117	10.4	78.9	3.8
Falls/bruises	120,141	14.0	83.2	4.0
School Environment	298,156	34.8	87.6	4.3
Playground injuries	156,892	18.3	89.4	4.4
Sports injuries	89,542	10.5	82.1	4.0
Sudden illness	51,722	6.0	91.2	4.5
Community Setting	171,789	20.0	79.8	3.9
Public accidents	78,234	9.1	76.3	3.7
Traffic incidents	45,892	5.4	81.4	4.0
Community events	47,663	5.5	84.7	4.1

5. Discussion

5.1 Principal Findings

The current systematic review of Red Crescent first aid training interventions is found to be highly effective in enhancing children's first aid skills in terms of multiculturality and education levels. Findings indicate that there is a huge advancement in the acquisition of knowledge (68.4% improvement), functional skill acquisition (72.1% improvement), and willingness to act in emergencies (58.7% improvement) through appropriately designed, culturally-suited first aid educational interventions.

The abstracted magnitude of such gains, herein accompanied by first aid knowledge retention rates that are high (82.4% at 12 months), constitutes strong evidence for the worth of initial investment in first aid. Such findings contribute to and support the findings of previous research in demonstrating that young children can be taught low-cost interventions with statistically significant improvement in first aid knowledge and skills.

5.2 Theoretical Implications

The career results validate a series of theoretical assumptions in successful children's learning. The achievement of large effect sizes (Cohen's d = 1.31-2.03) corroborates the observation that experiential learning approaches, together with social cognitive modelling, form the most optimal environment for skills acquisition and recall within the emergency response industry.

The consistent confidence gains exhibited over follow-up periods render it feasible to extrapolate self-efficacy theory to first aid training settings. Confidence on the part of the children to act in emergencies appears to persist beyond early periods of training, with further implications for internalization of efficacy beliefs on future interventionist and help-seeking behavior.

Adaptation to culture was also an early differential predictor of program success by region. This would be in line with contextualized theory arguments for the need for relevance of content and mode of instructional delivery to culture.

5.3 Practical Implications

Program Design: Literature supports multimodal programs where theoretical content, skill development, and simulation are combined with more efficacious outcomes compared to single-modality training. Enhanced learning is achieved when training is commenced in collaboration with the teachers and safety professionals who have experienced practical training having excellent impact on safety knowledge, validate the combined program design strategies.

Age-Appropriate Accommodation: Success at various ages illustrates the need for developmental responsiveness in curriculum design. The 6- to 8-year-olds learned a lot but required additional practice time and easier concepts, while the 15- to 18-year-olds showed more space for complex decision-making and leadership.

Cultural Sensitivity: Geographic programme variation suggests the necessity for adaptation at the content, delivery mechanism, and community outreach levels. Highly ranked programmes incorporated local tradition, language, and community structure in programme development and implementation design.

Issues of Sustainability: The improved knowledge retention means that initial investment in extensive first aid training pays back many times over in the years ahead. Refresher training and booster sessions can, however, be helpful to help in the maintenance of the highest achievable level of performance, particularly for complex procedural skills.

5.4 Community Impact Assessment

As well as individual direct use, the results show broader returns to families and communities by children's first aid training. That such a high a proportion of children are reporting chances to apply their skills in practice (23.4% within 12 months) is an indication of the fact that trained children themselves are effective immediate responders within families and communities.

The extremely high application success rates within the sector (79.8% to 87.6%) confirm that training is evidently maintained to perform well in emergency action. The usefulness of this innovation in emergency preparedness and community resilience is especially relevant in low-resource settings where no formal emergency services exist.

Family knowledge transfer, reported by 67.3% of the respondents, implies children's first aid training multiplier effects. Second-order benefit disseminates programme effect to indirect program beneficiaries, resulting in household and community emergency preparedness capacity building.

5.5 Implementation Considerations

Resource Needs: Cost-benefit analysis identifies Red Crescent first aid training programmes as low-cost per trainee (mean cost: $23.40 per child) but high-impact learning. This positive cost-benefit ratio justifies programme scale-up and sustainability planning.

Infrastructure Flexibility: Programmes were flexible in their capacity to operate with varying strengths of educational infrastructure. Effective delivery was possible in all poorly resourced settings through innovative adaptation of training content and methodology.

Quality Control: Standardized training procedure and test administration used in all countries involved provided for consistent quality with room for necessary cultural adaptation. It is in this

balance between standardization and customization that one of the main explanations for program effectiveness lies.

5.6 Limitations

There are a number of limitations upon which to interpret these findings. Study design, though large scale, cannot establish causality as definitively as randomized controlled trials can. Selection bias could have influenced results since schools and communities that participated could have been more resourced or dedicated to implementing first aid education programs.

Testing depended to a great extent upon formal demonstration of proficiency and repeated testing, neither of which can hope to mirror the nature of real emergency response situations. The relatively short follow-up period (12 months maximum) limits conclusions about long-term skill retention and maintenance.

Cultural and linguistic diversity in interpretation tests could have accounted for comparison scores between regions. Despite attempts at standardization, nuanced differences in meaning and response sets could have affected validity of cross-cultural comparisons.

Lastly, specificity of Red Crescent programs as the target would decrease generalizability to other nongovernmental humanitarian organizations or learning environments. Multiplicity of countries that took part and diversity of cultures, however, enhance external validity in comparable organizational environments.

5.7 Future Research Directions

The findings suggest a number of key research areas for the future. Longitudinal studies longer than 12 months would measure knowledge retention in the longer term and demonstrate evidence of refresher first aid course requirements. Longitudinal studies would also investigate whether first aid knowledge and proficiency are actually translated into real-world emergency response behavior.

Randomized controlled trials across different educational models (i.e., conventional teaching vs. technology-facilitated teaching vs. peer education models) would determine top delivery models for different settings and age levels.

Studies that take into account the wider community impacts of first aid training in children, i.e., family transmission rate of knowledge and readiness development in communities, would make stronger arguments for program expansion. Such studies are to be cost-effectiveness at a community level, including other benefits than direct participant impacts.

Cross-regional research on adaptation strategies within the regions would be utilized to adapt program information. Research would test for best balance between standardized and culturally adapted content for greatest impact and scalability.

6. Conclusion

This systematic review provides strong evidence about the effectiveness of Red Crescent learning interventions to develop children's first aid ability. The significant change observed in knowledge acquired (68.4%), skill learned (72.1%), and self-efficacy to act in an emergency (58.7%) is an evidence of the effectiveness of structured first aid training for children to empower them.

Findings indicate that children of diverse cultural and educational backgrounds are able to learn and remember first aid information upon receipt of developmentally-appropriate, culturally-relevant instructional interventions. Rates of application in actual situations (23.4% of the sample

at 12 months) and best response emergency actions (79.8%-87.6% success rates) indicate that training is being successfully translated into action capacity.

The results strongly support increased investment and expansion of Red Crescent first aid courses with cultural adaptation, age-adjusted content adjustment, and long-term delivery planned. The low cost per participant ($23.40 average) relative to high learning gain and probable public good presents strong rationale for expansion.

Priority program improvement recommendations are:

(1) development of effective working cultural adaptation guidelines for program quality and relevance

(2) long-term follow-up procedures to track knowledge retention and set the ideal frequency for refresher training

(3) employment of technology-delivered instructional content to increase utilization of traditional teaching methods

(4) collaborative partnerships with the community to ensure program effectiveness and sustainability.

The broader use goes beyond the acquisition of individual skills to embrace disaster preparedness and community resilience. First aid training for children is an investment in the future generation of emergency workers but also a catalyst for innovation in family and community safety skills.

While humanitarians everywhere are highly attuned to the sheer necessity for prevention and preparedness training, the evidence before us today makes the case itself as to what must be prioritized to introduce children's first aid education as a standalone element under organized disaster risk reduction and public health promotion initiatives.

The Red Crescent's vision to reach 40 million young people and children with such interventions through education activities by 2030 is not only plausible and ambitious and buttressed by the scalability and effectiveness of current program models but also requires increased research, program development, and international coordination to maximize such priority education interventions' impact.

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