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Strengthening Child Protection at Community Level: Impact of Educational Intervention on Knowledge, Attitudes, and Practices among Anganwadi Workers and Auxiliary Nurse Midwives—A Prospective Cohort Study from Bangalore, India

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Abstract

Background

Anganwadi workers (AWW) and auxiliary nurse midwives (ANM) serve as the primary interface between children and India's healthcare system. Despite high child abuse prevalence (52.22% sexual abuse, 67% physical abuse per 2007 national survey), these frontline workers often lack knowledge, attitudes, and procedural competence for early detection and reporting.

Objective

To evaluate the impact of a structured educational intervention on knowledge, attitudes, and practices (KAP) regarding child abuse prevention among AWW and ANM in Bangalore, India.

Methods

Prospective cohort study among 117 participants (65 AWW, 52 ANM; mean experience 4.2 ± 2.1 years). Baseline KAP assessed via validated 20-item self-administered questionnaire (knowledge: 10 items; attitude: 5 items; practice: 10 items). Intervention included 7-day formal education (printed materials, lectures, visual aids) + 3-day refresher after 1 month. Follow-up at 3 months. Analysis: χ^2-test, ANOVA, Spearman correlation (SPSS v26.0; $p < 0.05$).

Results

Significant knowledge improvement: 60.6% AWW and 20.8% ANM achieved higher competency ($p = 0.03$). Practice domain showed largest gains: 84% AWW and 69.9% ANM gained detection/reporting competence ($p = 0.02$). Attitude improvements positive but non-significant ($p = 0.08$; ceiling effect). Experience modified learning trajectories.

Conclusion

Structured interventions rapidly enhance child abuse prevention KAP among primary care workers. Integrating child protection training into AWW/ANM curricula, with standardized referral pathways and performance monitoring, will strengthen India's child protection system.

INTRODUCTION

Child abuse constitutes a multifaceted public health crisis with profound implications for India's primary healthcare system. Defined by the World Health Organization as "all forms of physical and/or emotional

ill-treatment, sexual abuse, neglect or commercial or other exploitation," child maltreatment results in actual or potential harm to a child's health, survival, development, or dignity.[1] In India, the 2007 Ministry of Women and Child Development survey documented alarming prevalence: 52.22% of children reported sexual abuse and 67% experienced physical abuse, with highest rates in Andhra Pradesh, Bihar, Assam, and Delhi.[2]

The psychological scars from early maltreatment impair attachment formation, self-esteem, and relationship development, increasing risks of substance abuse, mental disorders, and intergenerational violence transmission.[3] UNICEF estimates that untreated childhood trauma costs developing economies billions annually through healthcare utilization, lost productivity, and social welfare expenditures.[4]

Anganwadi workers (AWW) and auxiliary nurse midwives (ANM) represent India's grassroots primary care workforce, serving as first-contact providers for 90% of rural children through the Integrated Child Development Services (ICDS) and National Health Mission frameworks. Daily interactions with families position them uniquely to identify abuse indicators, initiate protective interventions, and facilitate referrals to child welfare committees. However, baseline knowledge deficits persist. [5]

Our previous cross-sectional KAP study among Bangalore's AWW and ANM revealed inadequate knowledge (34.7% AWW correct responses) and poor procedural competence (14.5% AWW knew reporting protocols), despite positive attitudes.[5] This baseline assessment established the need for targeted interventions—a gap confirmed by subsequent cohort evaluation demonstrating significant post-training improvements.[6]

Despite national policies like the Protection of Children from Sexual Offences (POCSO) Act 2012 and Juvenile Justice Act 2015 mandating reporting, implementation gaps at the primary care level undermine child protection. Studies from West Bengal and Jordan similarly document knowledge-practice disconnects among community health workers and dentists. [7, 8]

This prospective cohort study addresses this evidence gap by evaluating a structured educational intervention's impact on AWW and ANM child abuse prevention KAP. Building on our prior baseline cross-sectional findings [5] and intervention pilot, [6] we quantify knowledge gains, attitude reinforcement, and practice transformation—providing actionable evidence for workforce capacity-building in India's child protection ecosystem.

MATERIALS AND METHODS

Study Design and Setting: A Prospective cohort study was conducted among AWW and ANM in Bangalore Urban District, Karnataka, India. Participants were drawn from the existing cohort of our prior cross-sectional KAP study [5], which was utilised as the baseline data for post-intervention comparison.

Study Population and Sampling: Inclusion criteria: AWW and ANM from prior study who had ≥ 1 year of their work experience, and those attending scheduled monthly meetings regularly at primary health centres (PHCs).The exclusion criteria for the current study were participant's unwillingness to participate, absence during intervention period. There was an attrition of 4 AWW (2 transferred, 1 resigned, 1 deceased), and 1 ANM (transferred). Final cohort: 65 AWW, 52 ANM (total n = 117).

Sample characteristics (Table 2): AWW experience: 53.8% (1–3 years), 33.8% (4–7 years), and 12.3% (8–10 years). ANM experience: 42.3% (1–3 years), 36.5% (4–7 years), 21.1% (8–10 years). Mean experience: 4.2 ± 2.1 years.

Data Collection Instrument A Self-administered, pretested 20-item questionnaire which was also translated in the local language: Kannada from prior KAP research, was validated in pilot study (n = 6; 3 AWW, 3 ANM; and was evaluated by the statistical test Cronbach's α = 0.82).[5] The domains in the study were Knowledge (10 items): Abuse definitions, recognition signs, consequences (0–10 score); Attitude (5 items): Prevention responsibility, reporting duty, intervention willingness (0–5 score); & Practice (10 items): Detection procedures, reporting pathways, documentation, referrals (0–10 score) Items were scored dichotomously (correct = 1, incorrect = 0). Table 1 details instrument structure.

Intervention Protocol which was followed is as follows A Standardized 10-day program on Child Abuse was delivered during PHC monthly meetings: Days 1–7 were dedicated to Initial training with the help of Printed modules, 1–2 hour interactive lectures, colour plates/case scenarios, and referral flowcharts a refresher module of 3-days for recapitulation and consolidating knowledge, addressing queries, role-play exercises was conducted after 5 weeks. Content of training was- Abuse forms, behavioural/clinical indicators, medico-legal obligations (POCSO Act), district referral pathways, psychosocial first-aid.

Study Timeline

Baseline (T0): Pre-intervention KAP assessment (scheduled PHC meetings)

T1: 7-day initial training (Weeks 1–2)

T2: 3-day refresher (Week 5)

T3: Post-intervention KAP assessment (3 months post-baseline)

Ethical Clearance was taken from the Institutional Review Board, of Dr. Syamala Reddy Dental College Hospital & Research Centre, Bangalore; participants were informed of voluntary participation, confidentiality was warranted, and they had the right to withdraw. Confidentiality was maintained by keeping the responses anonymized; and data stored securely.

Data Management: Completed questionnaires were collected immediately post-administration, and were entered into Microsoft Excel 365 by two researchers (inter-rater reliability: 98.7%).Statistical Analysis: Software used SPSS v26.0, Descriptive: Means ± SD, frequencies, percentages by experience strata.

Inferential: - Proportion changes: χ^2 test (pre-post improvement rates), Mean score changes: Paired t-tests/Wilcoxon signed-rank tests (normality assessed via Shapiro-Wilk), Group differences: One-way ANOVA (experience strata: 1–3, 4–7, 8–10 years) Associations: Spearman correlation (experience vs. domain scores) Significance set at $p < 0.05$ (two-tailed). Effect sizes: Cohen's d for paired comparisons. Power calculation was done Post-hoc power ($\alpha = 0.05$, $n = 117$, effect size $d = 0.8$) was 0.92.

Table 1
Data Collection Tool Structure

Domain	Items	Score Range	Example Items
Knowledge	10	0–10	Which constitutes emotional abuse?; Physical signs of sexual abuse
Attitude	5	0–5	Mandatory to report suspected cases; Willing to counsel families
Practice	10	0–10	First step when abuse suspected; District Child Protection Unit contact

RESULTS

Participant Characteristics (Table 2) A total of 117 frontline health workers completed both baseline and 3-month follow-up assessments: 65 Anganwadi workers (55.6%) and 52 auxiliary nurse midwives (44.4%). These participants represent the essential workforce serving children at India's community level. The Experience distribution across the cohort was as follows:

Table 2
Years of Experience

Years of Experience	AWW (n = 65)	ANM (n = 52)	Total (n = 117)
1–3 years	35 (53.8%)	22 (42.3%)	57 (48.7%)
4–7 years	22 (33.8%)	19 (36.5%)	41 (35.0%)
8–10 years	8 (12.3%)	11 (21.1%)	19 (16.2%)
Mean ± SD	4.2 ± 2.1		

Nearly half (48.7%) had 1–3 years of experience, while those with 8–10 years represented 16.2% of participants.

3.2 Knowledge Domain (Tables 3, 4): Baseline knowledge revealed substantial differences between groups. Only 34.7% of AWW correctly answered knowledge questions, compared to 77.3% of ANM, reflecting ANM's formal nursing training advantage.

Post-intervention assessment demonstrated marked improvement:

Table 3
Knowledge Proficiency (Percentage Correct Responses)

Group	Pre-Intervention	Post-Intervention	Improvement
AWW	34.7% (24/69)	95.3% (62/65)	+ 60.6%
ANM	77.3% (41/53)	98.1% (51/52)	+ 20.8%
p-value	0.03*		
*Statistically significant (p < 0.05)			

Mean knowledge scores by experience level further illustrate the intervention effect:

Table 4
Mean Knowledge Scores by Experience Level (Maximum = 10)

Experience	AWW Pre → Post	ANM Pre → Post
1–3 years	3.4 ± 1.8 → **8.4 ± 1.6**	4.2 ± 2.5 → **8.2 ± 1.7**
4–7 years	3.9 ± 2.6 → **8.9 ± 0.6**	5.1 ± 2.1 → **8.8 ± 0.7**
8–10 years	7.6 ± 1.3 → **9.6 ± 0.3**	8.2 ± 2.6 → **9.2 ± 0.6**
p-value	0.03*	
*Statistically significant (p < 0.05)		

Newer workers demonstrated the largest absolute gains, while more experienced participants achieved near-ceiling performance.

Attitude Domain (Tables 5, 6): Both groups exhibited predominantly positive attitudes toward child protection at baseline:

Table 5
Positive Attitudes toward Child Abuse Prevention

Group	Pre-Intervention	Post-Intervention	Improvement
AWW	78.2% (54/69)	98.5% (64/65)	+ 20.3%
ANM	92.4% (49/53)	100% (52/52)	+ 7.6%
p-value	0.08^{+}		
$^{+}$Statistically not-significant (p > 0.05)			
The non-significant p-value reflects a ceiling effect, with mean attitude scores approaching maximum values post-intervention:			

Table 6
Mean Attitude Scores by Experience Level (Maximum = 5)

Experience	AWW Pre → Post	ANM Pre → Post
1–3 years	3.2 ± 1.1 → 4.4 ± 0.4	3.4 ± 1.2 → 4.2 ± 0.2
4–7 years	2.9 ± 1.8 → 4.6 ± 0.2	3.1 ± 1.9 → 4.8 ± 0.1
8–10 years	4.6 ± 1.5 → 4.8 ± 0.3	4.3 ± 1.7 → 4.9 ± 0.1
p-value	0.08[+]	
[+]Statistically not-significant (p > 0.05)		

Post-intervention, 98.5–100% of participants across experience levels demonstrated positive attitudes.

Practice Domain (Tables 7, 8): The practice domain revealed the intervention's most substantial impact. Pre-intervention procedural competence was alarmingly low:

Table 7
Procedural Competence for Detection and Reporting

Group	Pre-Intervention	Post-Intervention	Improvement
AWW	14.5% (10/69)	98.5% (64/65)	+ 84.0%
ANM	30.1% (16/53)	100% (52/52)	+ 69.9%
p-value	0.02*		
*Statistically significant (p < 0.05)			

The intervention's primary outcome was seen to improve with mean practice scores transformed across all experience levels:

Table 8
Mean Practice Scores by Experience Level (Maximum = 10)

Experience	AWW Pre → Post	ANM Pre → Post
1–3 years	3.2 ± 1.1 → 8.4 ± 1.4	3.4 ± 1.2 → 9.2 ± 0.6
4–7 years	2.9 ± 1.8 → 8.6 ± 1.2	3.1 ± 1.9 → 9.8 ± 0.1
8–10 years	4.6 ± 1.5 → 9.8 ± 0.1	4.3 ± 1.7 → 9.9 ± 0.1
p-value	0.02*	
*Statistically significant (p < 0.05)		
Domain Summary: The intervention produced statistically significant improvements across knowledge (p = 0.03) and practice domains (p = 0.02), with positive trends in attitudes (p = 0.08):		

Table 9
Summary of Domain Improvements**

Domain	AWW Improvement	ANM Improvement	p-value
Knowledge	+ 60.6%	+ 20.8%	0.03*
Attitude	+ 20.3%	+ 7.6%	0.08^{+}
Practice	+ 84%	+ 69.9%	0.02*
*statistically Significant (p < 0/05) $^{+}$statistically not significant (p > 0.05)			

Practice domain improvements were most pronounced, with AWW procedural competence increasing from 14.5% to 98.5%. This represents the critical transition from theoretical understanding to actionable skills required for effective child protection at community level.

DISCUSSION

This prospective cohort study demonstrates that structured educational interventions produce substantial, statistically significant improvements in child abuse prevention knowledge and practice among frontline primary care workers. Anganwadi workers (AWW) showed the most dramatic gains—knowledge proficiency increased 60.6% and procedural competence surged from 14.5% to 98.5% (p = 0.02). Auxiliary nurse midwives (ANM), starting from stronger baselines due to formal training, still achieved meaningful improvements across domains.

These findings confirm what frontline workers have long known intuitively: they care deeply about child protection but lack the specific knowledge and clear procedures to act effectively. Our intervention bridged this critical gap, transforming goodwill into actionable competence. [5, 6]

Knowledge Gains in Context: The 60.6% knowledge improvement among AWW aligns with recent Indian studies documenting baseline deficits among community health workers. D'Souza et al. (2025) found only 59.8% of Mangalore doctors demonstrated good child abuse knowledge, despite frequent patient contact. [9] Similarly, Alosaimi et al. (2025) reported 49.6% of Saudi paediatricians held poor perceptions toward abuse reporting, despite adequate knowledge. [10]

Our stratified analysis reveals that newer workers (1–3 years' experience) benefited most, jumping from 3.4/10 to 8.4/10. This suggests targeted training can rapidly "level up" less experienced staff—a cost-effective strategy for workforce scaling.[11] Seasoned AWW (8–10 years), already scoring 7.6/10 at baseline, reached near-perfect performance (9.6/10), confirming training reinforces existing competence.

The Critical Practice Domain Transformation: Practice competence improvements represent the study's most significant contribution. AWW procedural knowledge increased 84% (14.5% → 98.5%; p = 0.02),

enabling confident detection, documentation, and referral—the essential frontline functions. ANM improved 69.9% (30.1% → 100%).

This exceeds gains reported in comparable interventions. Chapagain et al. (2025) found Nepalese health workers improved abuse recognition post-training, but reporting confidence remained < 70%. [12] Our near-universal competence reflects the intervention's practical focus: concrete referral flowcharts, role-plays, and district-specific protocols participants could immediately apply. [6]

Attitude Ceiling Effect: A Positive Finding: The non-significant attitude improvement (p = 0.08) reflects high baseline positivity (78.2% AWW, 92.4% ANM), with post-intervention scores approaching ceiling (98.5–100%). This confirms frontline workers' intrinsic commitment to child protection—previously hindered by knowledge gaps rather than motivation. [5, 13]

Recent LMIC studies corroborate this pattern. Bjursell et al. (2025) found Swedish paediatric providers exhibited strong attitudes but inconsistent screening practices due to procedural uncertainty.[14] Our findings validate that attitudes alone insufficient; workers need "what to do next" clarity.

Comparison with Regional and Global Evidence: Our results build meaningfully on regional KAP literature. The 2015 baseline study established Bangalore's AWW/ANM deficits,[5] while this cohort evaluation quantifies intervention impact.[6] Gopalakrishnan et al. (2024) found coordinated ASHA/AWW counselling improved maternal outcomes but highlighted child protection training gaps.[15]

Globally, Cukovic-Bagic et al. (2023) emphasize legal-ethical reporting obligations across professions,[3] while Starling et al. (2024) document persistent underreporting despite training.[16] Our 84% practice gain suggests context-specific, hands-on training overcomes these barriers in resource-constrained settings.

Strengths and Limitations: Prospective cohort design with validated instrument; high response rates (100%); experience-stratified analysis; direct policy applicability; builds on published baseline data.[5, 6] But this being a Single-site Bangalore study limits generalizability; 3-month follow-up assesses retention but not long-term sustainability; self-reported practices also objective case reporting data unavailable; as well as this study assessed a modest sample (n = 117) appropriate for pilot size study and larger multi-district validation is suggested.

Policy and Practice Implications: These findings carry immediate implications for India's child protection ecosystem:

1. Curriculum Integration: Mandate child abuse modules (12–20 hours) in ANM/AWW pre-service training, including POCSO/JJ Act obligations, behavioural indicators, and district referral protocols. [17]

2. Annual Refresher Training: Implement cascade model where trained AWW/ANM serve as peer educators, preventing knowledge decay documented in LMIC studies. [12, 18]

3. Standardized Referral Systems: Distribute laminated flowcharts (abuse suspicion → reporting timeline → Child Welfare Committee contacts) to all 1.4 million AWW nationwide. [15]

4. Performance Linkage: Integrate child protection indicators into HMIS (Health Management Information System) for routine monitoring and resource allocation. [19]

5. Intersectoral Collaboration: Formalize MoHFW-MWCD convergence at block level, ensuring ANM/AWW/DSWO (District Social Welfare Officer) coordination. [20]

6. Legal Safeguards: State governments enact "Good Samaritan" clauses protecting reporters from civil/criminal liability, addressing documented barriers. [10]

Future Research Directions suggests multi-district RCTs comparing training modalities; 12–24 month retention studies; objective outcomes (actual case reporting rates pre/post); cost-effectiveness analysis for national scaling; qualitative exploration of implementation barriers at scale.

CONCLUSION

This study provides robust evidence that targeted training transforms frontline workers from passive observers to active child protection agents. With 84% of AWW achieving procedural competence, India possesses the workforce foundation to meaningfully reduce child maltreatment underreporting. The challenge now lies in policy execution—translating these capabilities into millions of protected childhoods through systematic curriculum reform, referral infrastructure, and performance accountability.

Declarations

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