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Original Research Article **Pediatrics**

A Quality Improvement initiative to decrease Referral from a Subdistrict Hospital in Rural India

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Abstract

Background: Lack of knowledge and training of Health Care Providers (HCPs) in managing Pediatric Emergencies often lead to increased referral from Subdistrict hospitals, even without prior stabilization. ***Methods:*** A Quasi-experimental study done in a Subdistrict hospital in West Bengal, India, to identify the gaps in health care quality and safety as per National Quality Assurance Standards (NQAS). Training was arranged for HCPs and the effects on hospital referral rate was analyzed. 18 Emergency Medical Officers (EMOs) and 18 Emergency nurses were included in this study following convenience sampling. Multidisciplinary teams of 6 participants were trained every weekly, from January to June in 2024 on management of common pediatric emergencies. ***Results:*** Significant improvement was noted in confidence, knowledge and attitude of HCPs in managing common pediatric emergencies. There has been significant (15%) improvement in NQAS Hospital Score, p value <0.001, decrease in hospital referral rate (9.43% to 6.61%) and mortality rate (2.46% to 1.23%) from January to June 2024.

Keywords: Referral, healthcare quality, safety, outcome, subdistrict hospital.

INTRODUCTION

Common pediatric emergencies encountered in ER of sub district hospitals in rural India are birth asphyxia, septic shock, severe asthma, status epilepticus, snake envenomation and poisoning, trauma, supraventricular tachycardia and cardiac arrest. Primary care providers in ER are EMOs and Emergency Nurses who usually do not have formal training in managing these cases. This lack of knowledge, skill and confidence often lead to increased referral of these patients to tertiary care level, without proper stabilization leading to poor outcome. [1-3]

Training programs are essential to improve pediatric emergency care in low-resource settings; however, a paucity of comprehensive curricula focusing specifically on pediatric emergency medicine currently exists. [4-6]

Aims:

1. Training of HCPs in managing common pediatric emergencies
2. Appraise the confidence, knowledge and attitude of HCPs before and after the training
3. Identify the overall impact on NQAS hospital score
4. Assess the impact of this training on hospital referral rate

METHODS

Study design: Quasi-experimental study

***Period of Study*:** 6 months (January – June '24)

Needs assessment (December 2023): To identify gaps and plan activities as per National Quality Assurance Standards (NQAS)

Sampling: Convenience sampling

Inclusion criteria: Emergency medical officers (EMOs) and Emergency (ER) nurses available throughout the study period

Exclusion criteria: Not giving consent to participate
Setting: Emergency room (ER), Labour Room (LR), Operation Theatre (OT)

Ethical clearance: December 2023

Sample size: 36 HCPs, 18 Emergency Medical Officers (EMOs) and 18 Emergency nurses after taking informed consent.

Intervention: 36 HCPs were distributed equally in 6 teams with 6 members in each team (3 EMOs & 3 ER nurses). Multidisciplinary team training (20 mins didactics, 20 mins skills training and 20 mins clinical case based discussions) was conducted every weekly for 2 hours duration (2 sessions on every Friday from 2- 4 pm), from January – June 2024.

Total 48 sessions were conducted over 6 months. HCPs were trained to manage 8 common pediatric emergencies encountered in a subdistrict hospital - birth asphyxia, septic shock, severe asthma, status epilepticus, snake envenomation and poisoning, trauma, supraventricular tachycardia (SVT) and cardiac arrest.

Manikins: Little Anne, Baby Anne, Resusci Anne, Prestan Adult torso and infant with appropriate props, moulage, software and equipment

Study tool: Pre & post questionnaire were filled up by the HCPs before and after training sessions. There were 10 questions in each set assessing the knowledge, attitude and confidence of the learners based on how they manage the common pediatric emergencies in hospital. Cumulative score in percentage (%) was calculated.

NQAS Safety and Quality assessment: Data collected in December 2023 and June 2024 with Self- assessment tool for health facility (SaQushal) 2022 and cumulative score was calculated before and at the end of study period [7].

Hospital records: Data on hospital admission, discharge, referral and death were analyzed.

Statistical analysis: The categorical variables are presented as frequencies and percentages. Fisher's exact test was used to analyze contingency tables. For all results, p value < 0.05 was considered statistically significant.

RESULTS

Various system changes have been implemented and alteration in behavior of HCPs was noted as shown in Table 1.

Significant improvement has been noted in the confidence, knowledge and attitude of HCPs depicted in Table 2.

Table 1: Implementation of System Changes

Pediatric emergencies System changes	Pediatric emergencies System changes
1. Birth asphyxia	Newborn resuscitation corner in ER/OT/LR
2. SVT	Defibrillator machine, Inj Adenosine
3. Cardiac arrest	CPR board, Step stool, Code blue team
4. Septic shock	Blood C/S facility, IV fluid & antibiotic
5. Severe asthma	Nebulization with O2, Syringe pump
6. Status epilepticus	Inj Midazolam, O2 in ER, Intubation tray,
7. Snake envenomation & poisoning	AVS, Inj Atropine & Neostigmine
8. Pediatric trauma	Cervical collar, Rapid Response Team

Table 2: Improvement in confidence, knowledge and attitude of HCPs

Cumulative score (%)	Pretest	Post test	Gain (%)
Confidence	31.6	85	53.4
Knowledge	30	86.6	56.6
Attitude	33.3	83.3	50

There has been 15% improvement in NQAS Hospital Score, $p<0.001$ as shown in Table 3.

Table 3: Improvement in NQAS Hospital score

December 2023(before training)	June 2024 (after training)	p value
50 %	65 %	<0.001

Table 4: Decrease in hospital referral and mortality rates

Months	Jan	Feb	March	April	May	June
Admission	933	1062	1255	1295	1307	1300
Discharge	773	904	1084	1170	1162	1096
Referral (%)	88 (9.43)	81 (7.63)	95 (7.57)	66 (5.1)	82 (6.27)	86 (6.61)
Death (%)	23 (2.46)	20 (1.88)	20 (1.59)	24(1.85)	25 (1.91)	16 (1.23)

A gradual decrease in hospital referral rate (9.43% to 6.61%) and mortality rate (2.46% to 1.23%) was noted from January to June 2024 as shown in Table 4.

DISCUSSION

To reduce referral rates from this hospital a comprehensive improvement has been initiated in the availability of diagnostic services by revising staffing schedules, ensured continuous availability of essential drugs and equipment through improved inventory management and backup supply arrangements. [8-9] Specialist availability has been ensured through recruitment assessments together with ongoing training of the existing EMOs and ER Nurses. These initiatives have fostered a more efficient healthcare environment with reduced referral rates over time. [10,11]

There has been a significant improvement in the confidence, knowledge, attitude and behavior of HCPs, as indicated by system changes that were incorporated in daily practice and reflected by the improvement of the hospital NQAS score at an interval of 6 months.

To our knowledge, this was the first study of its kind, done in a Subdistrict hospital in rural India, for the improvement of quality and safety of health care facility and to assess its impact on the behavior of HCPs and patient outcome.

CONCLUSION

Significant improvement was noted in confidence, knowledge and attitude of HCPs, improvement in healthcare quality and safety scores and decreased referral and mortality rates, though it can be multifactorial.

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