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Original Research Article

Standard operating procedure for paediatric inpatient care in a public general hospital in rural South India: a quality improvement project

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ABSTRACT

Background: The paediatrician stationed in a Public General Hospital noticed a significant number of complaints from the patient party about the delay in initial assessment and the quality of care provided in the hospital. This initiated the idea to review the standard of care given in the paediatric inpatient ward.
Methods: Aiming to ensure proper management of children in the paediatric inpatient ward, a team was formed to improve inpatient care and daily functioning of the ward. A standard operating procedure (SOP) was formulated referring to the National Rural Health Mission (NRHM), while modifying it to suit available resources and manpower in the hospital. A series of interventions were implemented and assessed using plan-do-study-act (PDSA) cycles. The findings from the PDSA cycle of a previous intervention were used to implement change in the next intervention. The data was analysed to accept the change or to further modify it.
Results: At the end of 3 months, improvement was noted with the increase in the bed occupancy rate by 22%, paediatric admission rate by 8%, bed turnover rate by 24%, percentage of new-borns exclusively breastfed from admission to discharge by 30%, and proportion of mothers given effective nutritional counselling by 35%. There was also decrease in the time taken for initial assessment by 50 minutes, average length of stay by 2 days and LAMA rate by 4%.
Conclusions: In the span of few months, we were able to implement an SOP and bring a significant improvement in the quality of care provided.

Keywords: Paediatric inpatient ward, PDSA cycle, Quality improvement project, Standard operating procedure

INTRODUCTION

The Government General Hospital in a rural taluk in Bangalore, is an establishment which caters to the medical needs of over 100,000 people, covering around 200 villages and 10 towns. It is a First Referral Unit (FRU). FRU introduced by the Government of India under the National Health Mission, provides comprehensive obstetric care services like caesarean section, new-born care, emergency care of sick children, full range of family planning services, safe abortion services treatment of STI/RTI availability of blood storage unit and referral transport services. This hospital has 24-hour emergency facilities, a daily multi-speciality outpatient service, fully functional labour rooms and operating theatres, and inpatient wards.

The paediatric inpatient ward in this hospital has a capacity of 30 beds. It is supervised by the sole paediatrician employed by the hospital and monitored by a nurse over the 24 hours (three nurses working in shifts), with emergency calls taken by the duty doctor.

The paediatric admission process begins after the decision is made to admit the patient, either in the outpatient clinic, or in the emergency room. Following the admission process, the patient party is taken to the inpatient ward to the assigned bed and instructions of the

admitting doctor is followed by the nursing personnel. There were a significant number of complaints from the patient party regarding the delay in the time taken from the decision to admit to the actual assignment of bed in the inpatient ward. To assess this there was no quality assessment tool in hand.

Due to there being no written standard treatment guidelines in the Paediatric inpatient ward, in times of any medical emergency or treatment dilemma during the absence of the Paediatrician, the stationed nurses or the duty Doctor were required to contact the Paediatrician for the next step of management. This caused a significant delay in the initiation of treatment. Due to there being no written triaging guidelines, the duty doctor was often required to contact the Paediatrician regarding referrals and admissions.

In retrospective analysis, the rate of leave against medical advice (LAMA) was found to be 20% in the previous year, which was above the recommended national benchmark. There was also a significant delay in identifying cases that needed referral to higher medical facility. It was also found that there were no active measures taken to assess efficiency in terms of bed occupancy rate, bed turnover rate and referral rate etc. There were also no measures to assess the clinical care in terms of percentage of new-borns resuscitated, adverse events rate and average length of stay. In addition to this, it was also noticed that there were no steps taken to ensure patient feedback.

Acute care of seriously ill children is a global health issue and there is much scope for improvement in quality of patient care in regions of low- and middle-income countries.[1] A great number of fatalities can be prevented by timely identification of the condition and initiation of the treatment, which can be enable by using a triage system for all children coming to the hospital seeking immediate care.[2] Other probable areas of patient care which require improvement include emergency care, inpatient care and monitoring.[3] In order to ensure appropriate care, it is not uncommon for many hospitals in resource poor setting to have an SOP that can be followed. Some of the guidelines that are followed while formulating the SOPs are the standards laid down by National Rural Health Mission by the Government of India, IMNCI guidelines and ETAT guidelines. [4-6]

It was hypothesized that having an SOP will ensure better quality of patient care in the paediatric ward. This was in terms of triaging, criteria and process for admission, initial assessment and treatment, criteria and process for referral, patient management in the ward, waste disposal, documentation of statistics. The results of the improvement were to be measured using assessment tools like case fatality rate, bed occupancy rate, LAMA rate, referral rate, bed turnover.

Objectives of the study

To ensure proper management of children (from new-born to 18 years of age) admitted in a paediatric ward by trained professionals, ensure tender care of acutely ill children. In order to do this, the scope of the project was to formulate a document which provides guidelines for the admission, discharge, management and monitoring of children admitted in paediatric and to also provide guidelines for equipment maintenance and maintenance of records.

METHODS

Study design

This study was a quality improvement project (QIP) which is a cross-sectional analysis using plan-do-study-act (PDSA) cycles.

Study place

The QIP was done in the General Hospital in rural South India.

Duration of study

The study took place over 3 months, from October to December 2020.

Inclusion criteria

All patients up to the age of 18, admitted in the paediatric inpatient ward during the study duration were included.

Exclusion criteria

New-borns requiring NBSU care and patients admitted above the age of 18 were excluded.

Procedure

Baseline data was collected from the hospital records. Relevant data was collected during each PDSA cycle periodically following the implementation of the SOP for reassessment.

Ethical approval

Ethical approval was not required because the study met criteria for exemption from such review according to an institutional policy (because the work was deemed an improvement activity and not human subjects research).

Statistical analysis

Statistical parameters were defined as indicators of the outcome of the assessment (Table 1).

Table 1: Defining the indicators of assessment.

	Indicator	Indicator measurement
1.	Bed occupancy rate	(Total inpatient days of care/bed days available) × 100
2.	Proportion of mother given nutritional counselling	No. of mothers given nutritional counselling/total number of mothers in ward
3.	Paediatric admission rate	Number of paediatric admission × 100/indoor admission
4.	Bed turnover rate	Number of patients per day (service days) in a month × 100/number of beds × 30
5.	Percentage of infants exclusively breastfed from admission to discharge	Number of infants exclusively breastfed from admission to discharge × 100/total number of infants admitted in the paediatric ward
6.	Time taken for initial management	Average of time duration between OP slip time and initial assessment in IP ward
7.	Average length of stay	Mean of the admission duration in number of days
8.	LAMA rate	Number of LAMA × 100/total number of admissions

Interventions

Our interventions were to formulate a standard operating procedure (SOP) and to implement it in the daily functioning of the ward. To do this we, the two interns posted in the hospital, formed a team supervised by the paediatrician and the administrative medical officer. While formulating the SOP, the guidelines laid down by the Government of India in the NRHM were referred to, while also using the IMNCI guidelines and ETAT guidelines. These were modified to suit the setting of the hospital.

Guidelines were laid down for the admission, discharge, leave against medical advice (LAMA) and end of life care. At the initial point of assessment, the children were to be triaged referring to the ETAT guidelines and IMNCI guidelines. Colour coding was implemented in the triage system, PINK for urgent referral, YELLOW for treatment in the ward, GREEN for treatment at home. Those children meeting the criteria for referral or transfer were to be referred to a higher centre. Procedure for referral or transfer, and the process were formulated. Pointers were added to assess and manage emergency signs. Steps for facility-based care of sick infants and children were also mentioned. The SOP also included the Standard Treatment Guidelines for the common diseases managed in the ward and the inventory management.

Indicators for assessment were noted down, and these were to be the standard analytic tool to assess the outcome. To do this the baseline values for each of the indicators were assessed prospectively for the first month and documented. The final outcome was to be compared to these values.

The interventions to be implemented were tested using PDSA cycles. Each cycle lasted for 15 days after which there was reassessment and collection of findings. These findings were used to map the subsequent PDSA cycle.

RESULTS

PDSA cycle 1 (day 1-15)

During the first cycle we aimed to increase awareness of the problem in the paediatric inpatient ward among the healthcare workers and to provide the necessary training and education. This was to ensure a common acknowledgement of the situation, so that everyone can partake in improving the quality of care. This consisted of two interventions. The first consisted of educating the personnel about the gap in the standard of care provided in the hospital and the one expected. This was conducted by the paediatrician in the ward at the time of change of shifts so that the staff from either shift could attend the same. It also included the staff from the emergency room. A series of sessions were conducted, which were interactive, and feedback based to ensure maximum understanding. The new SOP and guidelines were explained and access to copies were given. The second intervention included putting up the ETAT and IMNCI flowcharts in the ward and the Emergency room. This was also pointed out to the working staff, and they were asked to refer to it.

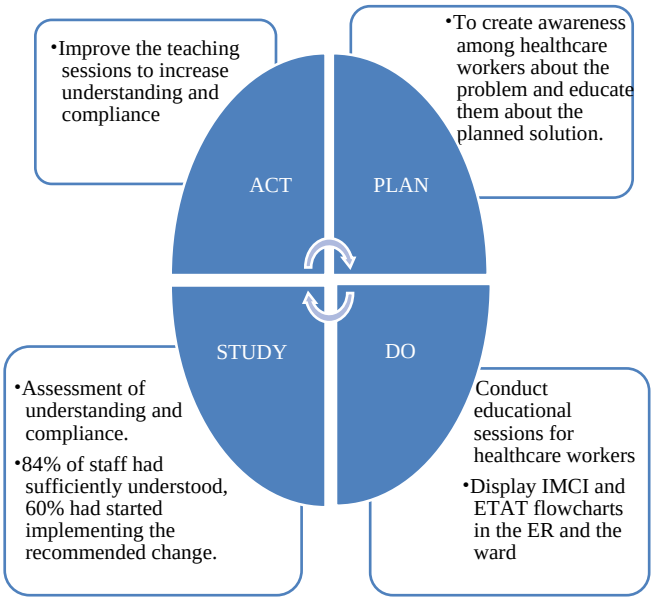

Figure 1: PDSA cycle 1.

During the first cycle, the understanding and the compliance to the change by the healthcare workers was assessed. Understanding was assessed by conducting post session tests. Assessment of compliance was done by silent monitoring of inpatient ward work and emergency room and noting the number of personnel following the new change.

It was observed that 84% of the staff had sufficiently understood the changes to implemented and the gravity of the situation. But only 60% of the staff had started implementing the change in their work. To combat this, another set of teaching sessions were planned to be conducted.

PDSA cycle 2 (day 16-30)

During the second cycle, the aim was to improve the teaching in order to get better results than the first cycle. The different approach implemented was to include practical sessions. The staff were asked to demonstrate triaging, identify danger signs and perform mock referrals. They were also explained about the indicators that were aimed to be improved. After implementing the intervention, the staff was assessed again. This time, 96% of the staff had sufficiently understood the change and it was observed that 84% had effectively implemented the change in their work. The further plan was to conduct frequent sessions to reinforce the change. These sessions were to be conducted every month.

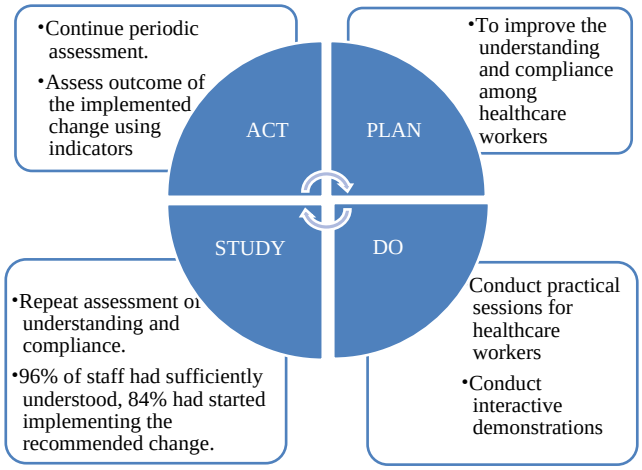

Figure 2: PDSA cycle 2.

PDSA cycle 3 (day 31 to 45)

After ensuring adequate compliance to the new guideline by the healthcare workers, the team sought to focus on ensuring that the change was resulting in meeting the target outcome. The indicators were assessed prospectively from the end of the 2nd PDSA cycle. After the assessment the outcomes were compared to the baseline values. The series of interventions resulted in an improvement in these factors. At the end of assessment, the time taken for initial assessment was 60 minutes (an improvement from the baseline value of 90 minutes), the bed occupancy rate was 64% (an improvement from the baseline value of 50%), the paediatric admission rate was 25% (an improvement from the baseline value of 20%), the bed turnover rate was 63% (an improvement from the baseline value of 56%), the percentage of new-borns exclusively breastfed from admission to discharge was 78% (an improvement from the baseline value of 60%), the proportion of mothers given effective nutritional counselling was 84% (an improvement from the baseline value of 65%), the average length of stay was 6 days (an improvement from the baseline value of 7 days), the LAMA rate was 7% (an improvement from the baseline value of 8%). There was significant change in the outcomes since the implementation of the changes. But the improvement in the areas of nutritional counselling to mothers, exclusively breastfed new-borns and LAMA rate were not sufficient. The next step of action was to concentrate in these areas while continuing the changes in the other areas.

PDSA cycle 4 (day 46-60)

To ensure better nutritional counselling to the mothers and exclusive breastfeeding of new-borns, the paediatrician personally supervised the counselling sessions in the ward. She ensured that the mothers and the attenders understood the importance of adequate nutrition and exclusive breastfeeding, while also highlighting the harm in practicing taboos. Proper technique of breastfeeding was also taught during these sessions. The mothers were also asked to demonstrate. After the first week, she observed the Staff nurses conduct these sessions and corrected them when necessary. To improve the LAMA rate, feedback was obtained from patients. It was noted that the counselling given during the admission regarding the nature of the illness and the approximate duration of stay was not sufficient. This was tackled by ensuring adequate and routine preadmission counselling. The supervision of the implementation of other guidelines were also done simultaneously. At the end of 15 days the indicators were assessed. At the end of assessment, the time taken for initial assessment was 40 minutes (an improvement from the baseline value of 90 minutes), the bed occupancy rate was 72% (an improvement from the baseline value of 50%), the paediatric admission rate was 28/% (an improvement from the baseline value of 20%), the bed turnover rate was 80% (an improvement from the baseline value of 56%), the percentage of new-borns exclusively breastfed from admission to discharge was 90% (an improvement from the baseline value of 60%), the proportion of mothers given effective nutritional counselling was 100% (an improvement from the baseline value of 65%), the average length of stay was 5 days (an improvement from the baseline value of 7 days), the LAMA rate was 4% (an improvement from the baseline value of 8%). There was significant improvement in the lagging outcomes since the implementation of the

changes. Thus, at the end of 3 months the interventions showed satisfactory outcomes.

Table 2: Indicators to assess outcomes at the end of PDSA cycle 3 and 4.

Indicators	Baseline	PDSA cycle 3	PDSA cycle 4
Time for initial assessment	90 min	60 min	40 min
Bed occupancy rate	50%	64%	72%
Paediatric admission rate	20%	25%	28%
Bed turnover rate	56%	63%	80%
Percentage of new-borns exclusively breastfed from admission to discharge	60%	78%	90%
Proportion of mothers given effective nutritional counselling	65%	84%	100%
Average length of stay	7 days	6 days	5 days
LAMA rate	8%	7%	4%

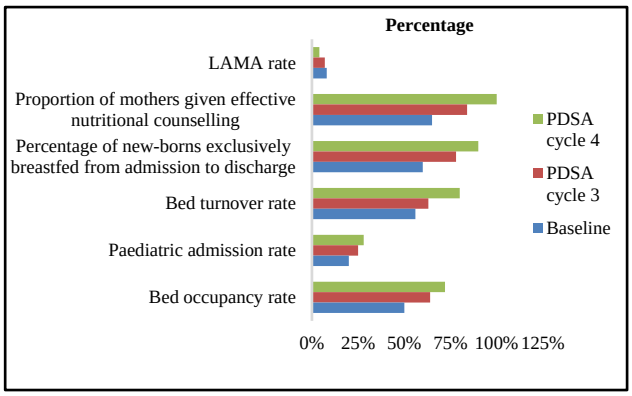

Figure 3: Comparison of indicators.

DISCUSSION

Summary

An SOP provides a reckoner to the healthcare workers and enables the smooth functioning of the ward. In the absence of a standardized guide and periodic assessment tools, there was an inability to identify the gap in the quality of healthcare provided, and in extension to address the problems. We thus implemented an SOP, referring to standard national guidelines set by NRHM, IMNCI and ETAT, keeping in mind the setting of the hospital and the available resources. A set of indicators were defined to objectively quantify the difference caused by the implemented intervention. In order to assess and rectify the changes, we used quality improvement methodology using PDSA cycles.

While we aimed to concentrate on putting into action the implementation of the SOP in the daily functioning of the ward, we realized that a major factor was the education of the healthcare workers to understand the need for the change and observe it in practice. This was objectively assessed in the subsequent PDSA cycles.

Interpretation

Upon implementing the SOP and providing the preliminary education, the interventions were tested in a methodical manner with each PDSA cycle acting as a cross section. The indicators pointed to the weak points in the planned improvement, and thus more focus was given to those parameters in the subsequent cycles.

At the end of 3 months, improvement was noted from the baseline with the increase in the bed occupancy rate by 22%, paediatric admission rate by 8%, bed turnover rate by 24%, percentage of new-borns exclusively breastfed from admission to discharge by 30%, and proportion of mothers given effective nutritional counselling by 35%. There was also decrease in the time taken for initial assessment by 50 minutes, average length of stay by 2 days and LAMA rate by 4%.

Even though there are few literatures on similar interventions, there is sufficient emphasis on the need for maximum efficiency in resource poor healthcare settings as highlighted by Sigrest et al.[7] There is also evidence pointing towards an enthusiastic management and motivated healthcare workers being the key to the success of an SOP in a hospital.[8]

Strength of the study

This QIP enabled the implementation of a SOP for the paediatric inpatient ward in a resource poor setting. We faced certain hurdles in its implementation, but we were able to identify and rectify them using the methodology at hand. This can be used by other healthcare providers to compare and implement similar changes in their setting. Even though the protocols laid down maybe tailormade to a particular setting, the implementation and the challenges could be expected to be similar.

One of the main limitations of this project is that it is not a point fix. To ensure that the observed change is maintained, the objectives and the content of the SOP must be periodically reinforced among the healthcare workers to ensure compliance. Also, to identify the

shortcomings the efficiency indicators are to be assessed in fixed intervals. This may prove to be a challenge in the instance of change in staff or management.

CONCLUSION

Implementing a standard operating procedure is vital for the smooth functioning of a hospital in a resource poor setting. In our initial effort to implement the SOP and see it in actual use, we faced some setbacks. But with the subsequent interventions we saw to it that the changes initiated caused a significant improvement in the quality of patient care in the paediatric inpatient ward. There was satisfactory change in the way the hospital was functioning over the period of 3 months during which the quality improvement project was conducted.

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Conflict of interest: None declared
Ethical approval: Not required

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