DEDER GENERAL HOSPITAL

HEALTHCARE QUALITY IMPROVEMENT PROJECT

Improving Intensive Care unit (ICU) Enteral Feeding

By: ICU QI TEAM

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Graduated QI project: Improving Intensive Care unit (ICU) Enteral Feeding, May 2017E.C

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ABSTRACT

Background: Enteral feeding is a vital component of ICU care for patients unable to eat orally, yet many institutions face barriers to delivering timely, adequate nutrition. At Deder General Hospital, a baseline audit conducted from **October 30, 2017E.C to December 07, 2017E.C**, showed that only **36.7%** of ICU patients received appropriate enteral nutrition, posing significant risks of complications, prolonged recovery, and increased mortality.

Objective: To improve the ICU enteral feeding from the current median of **36.7% to more than 80%** from **December 15, 2017E.C to May 30, 2017E.C.**

Methods: A quality improvement project was conducted using the Model for Improvement and four Plan-Do-Study-Act (PDSA) cycles. Interventions included protocol **development and staff training** (**PDSA 1**), **procurement of feeding equipment** (**PDSA 2**), implementation of **daily multidisciplinary nutrition-focused rounds** (**PDSA 3**), and **weekly audits with feedback** (**PDSA 4**). Data were collected **bi-weekly** using outcome, process, and balancing measures.

Results: Adherence to enteral feeding protocols improved progressively with each PDSA cycle. After **PDSA 1** (protocol and training), compliance rose from **36.7% to 60%**. **PDSA 2** (feeding preparation equipment availability) further increased compliance to **82%. PDSA 3** (conduct nutrition rounds) maintained performance at **88%,** while **PDSA 4** (conduct audits with feedback) raised it to **92.3%** by May 30, 2017E.C. The overall median compliance across the project period was **83%.** Importantly, ICU mortality declined from **10%** at baseline to **2%** by the end of the project, demonstrating the clinical impact of improved nutritional care.

Conclusion: The ICU Enteral Feeding Quality Improvement Project at Deder General Hospital illustrates how structured, team-based, and low-cost interventions can dramatically enhance critical care in resource-limited settings. The successful use of PDSA cycles to iteratively address barriers provides a practical and replicable model for improving ICU nutrition and patient outcomes.

INTRODUCTION

Enteral feeding is a vital component of critical care for ICU patients who cannot meet their nutritional needs orally. Adequate and timely enteral nutrition has been proven to enhance patient outcomes, including reducing infection rates, accelerating wound healing, and shortening ICU stays. However, challenges such as delayed initiation of feeding, frequent interruptions, and failure to meet nutritional targets persist in many healthcare settings. This gap poses significant risks, including malnutrition, prolonged recovery, increased complications, and higher healthcare costs, underscoring the urgent need for systematic improvements in enteral feeding practices.

Rooted in the institution's core values of community-centric care, collaboration, and innovation, the project embodies a commitment to excellence in patient care while addressing a critical gap identified through rigorous problem prioritization. Through these efforts, Deder General Hospital strives to set a benchmark for quality and innovation in ICU care delivery.

CONTEXT

This quality improvement project was implemented to **improve ICU enteral feeding** at Deder General Hospital.

STATEMENT OF PROBLEM

A recent audit conducted in the ICU of Deder General Hospital from **October 30, 2017E.C to December 07, 2017E.C,** revealed that only **36.7%** of eligible patients achieved their prescribed enteral nutritional goals following ICU admission. This inadequacy in timely and adequate enteral feeding exposes patients to risks of malnutrition, heightened complications (such as infections and delayed recovery), prolonged ICU stays, and increased healthcare costs, necessitating urgent systemic improvements to optimize nutritional care delivery.

AIM STATEMENT

The aim of this QI project was aimed to improve the ICU enteral feeding from the current median of **36.7% to more than 80%** from **December 15, 2017E.C to May 30, 2017E.C.**

ASSESSMENT OF PROBLEM AND ANALYSIS OF ITS CAUSES:

To improve the ICU enteral feeding at Deder General Hospital, the quality improvement team used the Model for Improvement (MFI) and the Plan, Do, Study, Act (PDSA) cycle to test change ideas. We used Fishbone and Driver diagrams to identify and address root causes.

INTERVENTION

The QI team analyzed the root causes using a fishbone diagram **(figure 1),** plotted possible intervention packages using driver diagram and designed an implementation plan **(figure 2)**. A series of PDSA cycles were conducted. Intervention data were collected and analyzed bi-weekly. the intervened change ideas were:

- Provide training on ICU enteral feeding Protocol
- Avail feeding preparation machine and refrigerator
- Conduct a daily round focusing on enteral feeding.
- Conduct weekly audit with feedback:

FISHBONE DIAGRAM

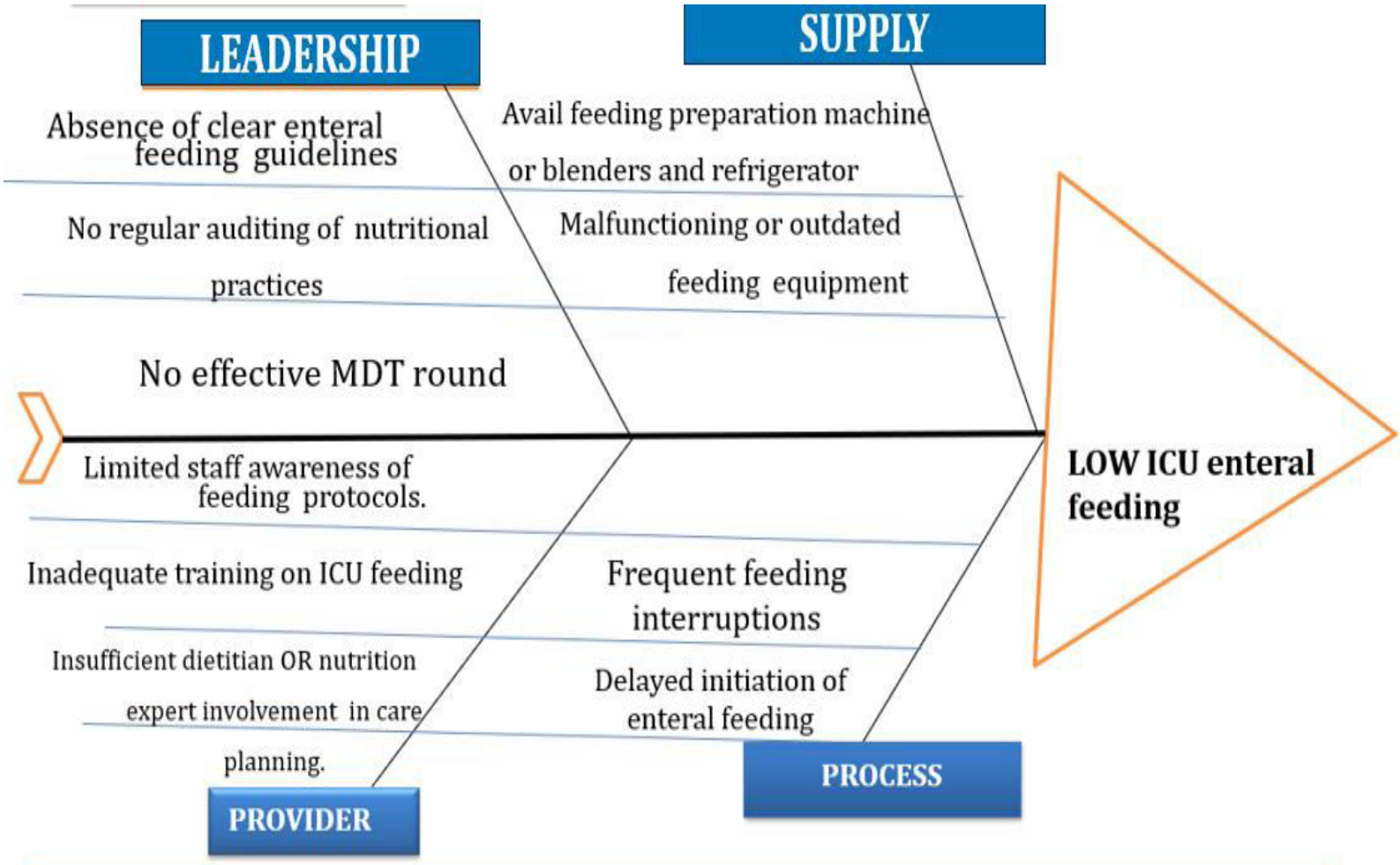

***Figure 1**: Fish Bone Diagram to improve the ICU enteral feeding from the current 36.7% to more than 80% from December 15, 2017E.C to May 30, 2017E.C.*

DRIVER DIAGRAM

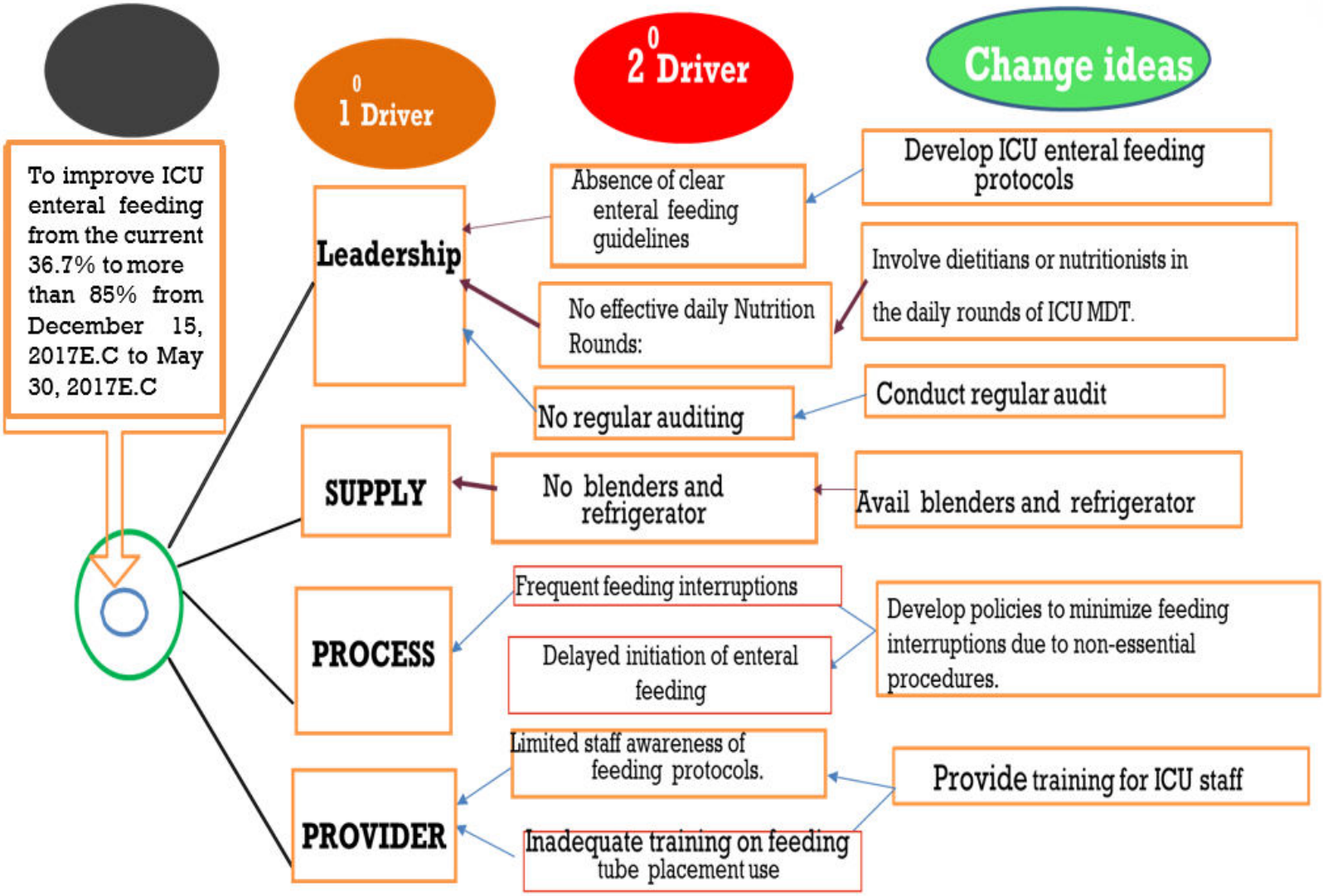

***Figure 2**: Driver Diagram to improve the ICU enteral feeding from the current 36.7% to more than 80% from December 15, 2017E.C to May 30, 2017E.C.*

MEASURES

Outcome measurement

- % of ICU patients received appropriate enteral feeding.

Process measures

- Proportion of ICU staff trained on ICU feeding protocol
- Proportion of ICU feeding preparation machines/blenders and refrigerators availed
- Proportion of daily nutrition rounds conducted as planned
- Proportion of audits conducted with documented feedback

Balancing measures

- Proportion of ICU Mortality rate

IMPLEMENTATIONS OF PLAN OF PDSA

Table 1: ***Process Measures:***

Change Idea	HOW	WHO	When	Where
Develop ICU Enteral Feeding Protocol & Provide training for staff	The Quality Director, ICU Head, and a team of dietitians collaborated to develop an evidence-based enteral feeding protocol tailored to the ICU's needs. They finalized the guidelines within four weeks, incorporating input from medical experts and global best practices. To ensure adoption, the hospital's education team and senior ICU nurses provided hands-on training through workshops and simulations. Over six weeks, all staff completed competency assessments, boosting confidence in applying the new protocol.	Quality Director, IPD Director, ICU Head, nutrition expert, and Senior ICU Nurses.	December 15-Jan 15, 2017E.C	Deder General hospital training hall
Avail ICU feeding preparation machines/blenders and refrigerators	The finance Department secured feeding preparation machines, blenders, and refrigerators. Biomedical engineers installed the equipment, and trained nurses on safe operation and maintenance.	Hospital finance Department, Biomedical Engineers, & ICU teams	January 16-February 30, 2017E.C	Deder General hospital ICU
Conduct daily enteral feeding focused rounds	Daily enteral feeding rounds Led by the ICU physician and nutrition expert, nurses and pharmacists joined these rounds to review each patient's feeding progress using standardized checklists. They adjusted feeding plans in real-time, ensuring personalized care and adherence to the protocol.	ICU physician, nutrition expert, nurses and pharmacists	March 01-April 15, 2017E.C	Deder General hospital ICU
Conduct audits with feedback	The Quality Unit carried out weekly audits and shared findings in bi-weekly feedback sessions with the ICU staff. These meetings fostered accountability and allowed the team to troubleshoot challenges, leading to continuous refinement of processes.	Quality officers	April 16-May 30, 2017E.C	Deder General hospital ICU

Table 2: ***Data collection Plan (process indicators)***

Process/Change idea	Data source (Where)	Data collection method (how)	Time (When)	Responsible body
Develop ICU Enteral Feeding Protocol & Provide training for staff	ICU, HR,& Quality Unit	Training Attendance & observation	December 15-Jan 15, 2017E.C	Quality Director, IPD Director, ICU Head, nutrition expert, and Senior ICU Nurses.
Avail ICU feeding preparation machines/blenders and refrigerators	ICU & Finance	Document review (Model 19 & 20)	January 16-February 30, 2017E.C	Hospital finance Department, Biomedical Engineers, & ICU teams
Conduct daily enteral feeding focused rounds	ICU	Round book & attendance	March 01-April 15, 2017E.C	ICU physician, nutrition expert, nurses and pharmacists
Conduct audits with feedback	ICU & Quality Unit	Document review	April 16-May 30, 2017E.C	Quality officers

Table 3: *Process Indicator Performance Tracking Sheet*

S.No	Change Ideas/ Interventions	Number/session on planned	Number/session performed	% of achievement	Remark
1.	**Develop ICU Enteral Feeding Protocol & Provide training for staff**	1	1	100%	
2.	**Avail feeding preparation machine or blenders and refrigerator**	1	1	100%	
3.	**Conduct daily Nutrition Rounds:**	45 days	45 days	100%	
4.	**Conduct weekly audit with feedback:**	6	6	100%	

Do of PDSA

Table 4: ***Outcome Indicator Performance Tracking Sheet***

AIM	Numerator, Denominator & outcome Indicator	Time: Bi-Weekly										
		30-Dec-17	**15-Jan-17**	**30-Jan-17**	**15-Feb-17**	**28-Feb-17**	**15-Mar-17**	**30-Mar-17**	**15-Apr-17**	**30-Apr-17**	**15-May-17**	**30-May-17**
QIP: To improve the ICU enteral feeding from the current 36.7% to more than 80% from December 15, 2017E.C to May 30, 2017E.C.	**Numerator**: Number of ICU patients who received prescribed enteral feeding	**4**	**5**	**7**	**9**	**7**	**6**	**8**	**7**	**7**	**8**	**9**
	Denominator: Total number of ICU admitted patients.	**7**	**8**	**9**	**10**	**9**	**7**	**9**	**8**	**7**	**9**	**10**
	Indicator: Percentage of ICU patients received appropriate enteral feeding.	**57**	**63**	**78**	**90**	**78**	**86**	**89**	**88**	**100**	**89**	**90**

RESULTS

A quality improvement project at Deder General Hospital transformed enteral feeding practices in the intensive care unit. Over a five-month and half period, adherence improved significantly, from a baseline median of **36.7% to 83% (Figure 3).**

This success was achieved through a series of Plan-Do-Study-Act (PDSA) cycles, each carefully designed to close critical gaps in nutrition delivery while maintaining a strong focus on patient safety and teamwork. **PDSA Cycle 1 (December 15-Jan 15, 2017E.C)** set the groundwork by introducing **standardized feeding protocols** and **providing targeted staff training**. As a result, compliance rose from **36.7% to 60%,** with **9 out of 15 ICU** patients receiving timely and adequate enteral nutrition **(Table 4).** This initial improvement highlighted how equipping frontline staff with clear guidelines and practical skills can yield immediate results. However, challenges like limited access to essential equipment and workflow interruptions remained, paving the way for the next phase. **PDSA Cycle 2 (January 16- February 30, 2017E.C)** directly addressed these challenges. The team **procured feeding preparation machines and refrigerators,** ensuring more reliable equipment and smoother processes. Compliance jumped to **82.4%,** with **23 out of 28 patients** benefiting from the improvements **(Table 4).** Nurses reported feeling more confident in handling complex cases, and families observed fewer delays in feeding initiation.

PDSA Cycle 3 (March 01-April 15, 2017E.C) introduced **daily multidisciplinary rounds** to tailor care plans more precisely to each patient's needs. Compliance held steady at **88%,** with **21 out of 24 patients** meeting their nutritional targets **(Table 4).** Although progress had slightly plateaued, ongoing issues like inconsistent documentation and variable practices between shifts were identified for further action. **PDSA Cycle 4 (April 16-May 30, 2017E.C)** focused on these remaining issues by implementing **weekly audits and providing real-time feedback**. This pushed compliance even higher—to **92.3%,** with **24 out of 26 patients** receiving optimal enteral nutrition **(Table 4)**. Beyond improving feeding practices, this final phase helped cultivate a culture of accountability, where staff regularly reviewed data to sustain and build on the improvements.

The project's success went beyond adherence to enteral nutrition. Improved nutritional care was associated with reduced ICU mortality rates, a critical balancing act. Initial audits conducted in **December 2017E.C** revealed a **10% mortality rate in the ICU**. However, by **May 2017E.C**, the **ICU mortality rate** had steadily **declined to 2% (Figure 4).** This reduction highlights how targeted improvements in nutrition protocols not only achieved nutritional goals but also ensured patient survival, reinforcing the correlation between systemic care changes and overall outcomes.

RUNCHART WITH MULTIPLE PDSA CYCLE TO IMPROVE THE ICU ENTERAL FEEDING

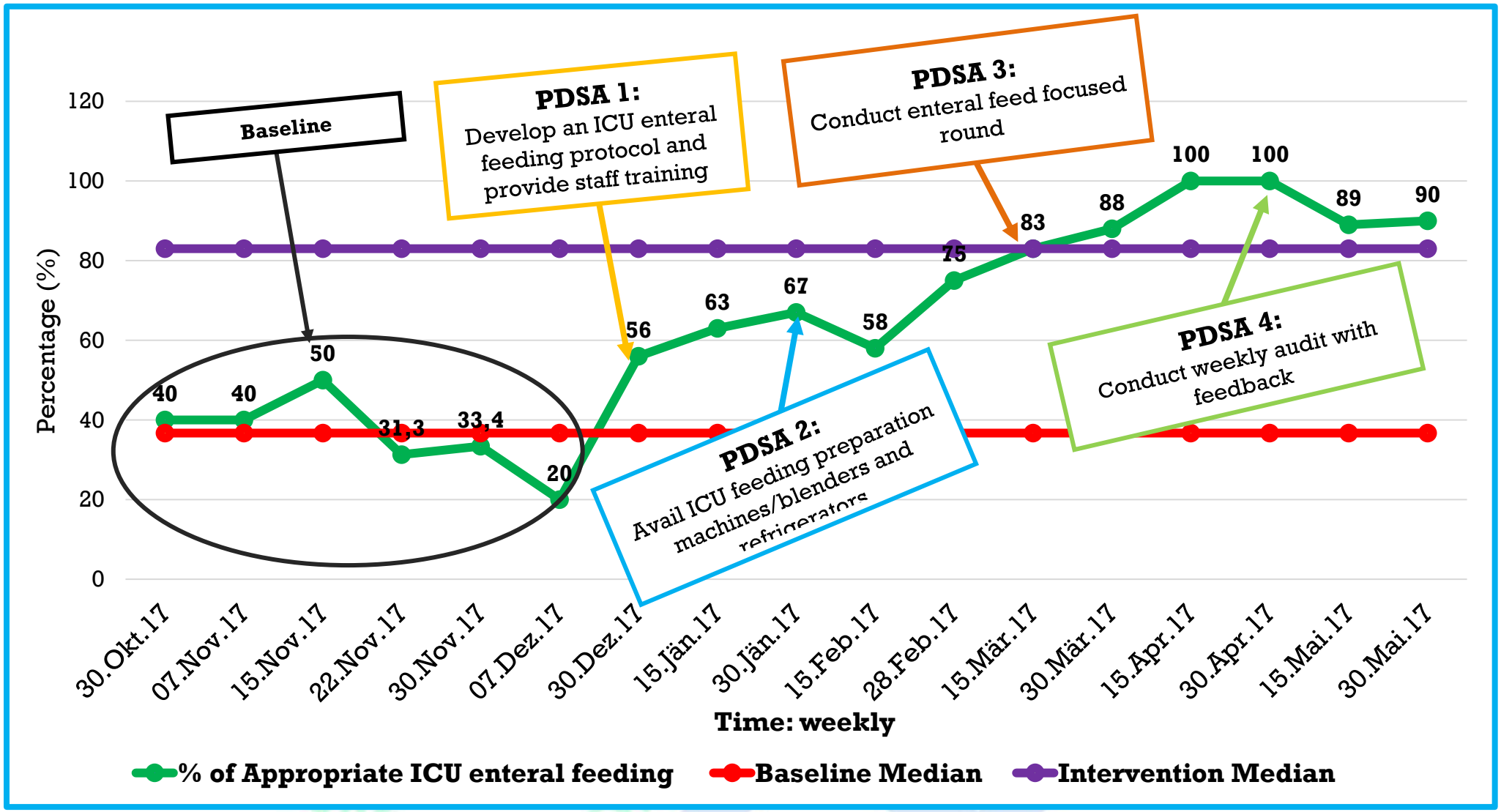

Figure 3: *Run chart with multiple PDSA cycles to improve the ICU enteral feeding from the current 36.7% to more than 80% from December 15, 2017E.C to May 30, 2017E.C.*

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BALANCING MEASURE OUTCOMES

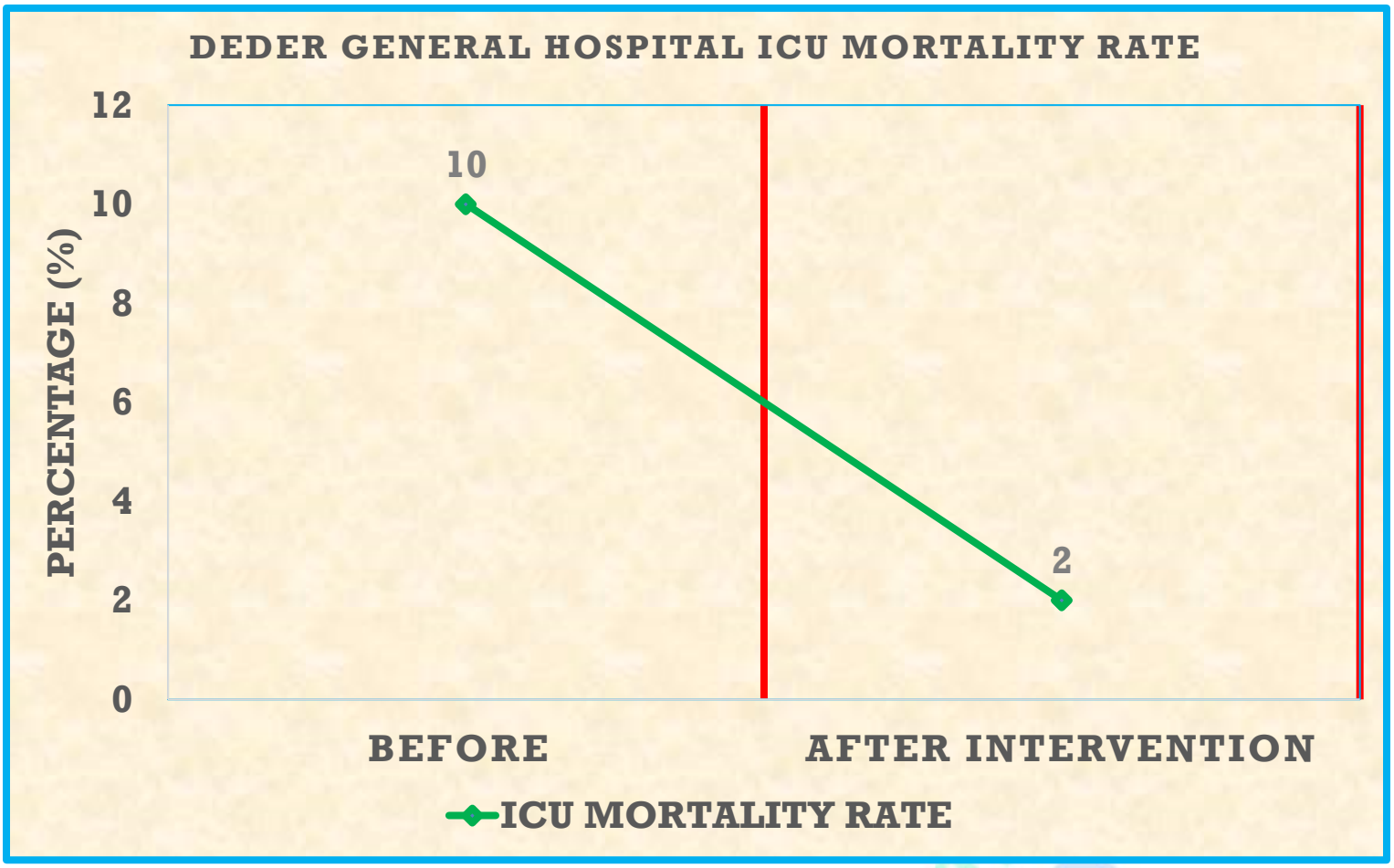

Figure 4: *Shows that improved ICU enteral feeding resulted that reduced ICU mortality rate (NMR) from* ***December 15, 2017E.C to May 30, 2017E.C.***

DISCUSSION

The success of this quality improvement effort in Deder General Hospital's ICU shows that even in settings with limited resources, simple, focused changes can lead to major improvements in patient care—especially when it comes to nutrition. By using the PDSA cycle method to tackle real-world challenges like unclear feeding protocols, equipment shortages, and uncoordinated care, the team was able to boost enteral feeding compliance to a median of 83%, surpassing the 80% target, and reduce ICU mortality from 10% to just 2%. Each step of the process played a critical role: the first phase focused on standardizing feeding protocols and training staff, laying the groundwork for consistent care. Then came the procurement of essential tools—like blenders and refrigerators—that made it easier to deliver nutrition reliably. The addition of daily multidisciplinary rounds ensured that each patient's needs were addressed, while weekly audits kept the team accountable and motivated. These steps worked together to create a cycle of continuous improvement, proving that even small, strategic investments in teamwork and basic tools can have a profound impact on patient outcomes.

But the value of this project goes beyond just numbers. It highlights the critical connection between nutrition and survival in critically ill patients. The dramatic drop in mortality echoes global research: timely enteral feeding can prevent complications like infections and muscle breakdown, helping patients heal faster. What's even more impressive is that this was all done in a cost-effective way—using existing staff, simple solutions like checklists, and gradual, thoughtful changes. This makes the project not only successful but also replicable in other low-resource ICUs. However, keeping these gains will depend on sustained leadership and staff commitment. One standout feature—the nurse-led audits—helped build ownership among staff, but this needs to be formally supported to continue long-term. For other hospitals, this initiative serves as a clear roadmap: focus on clear protocols, support your teams with the tools they need, and use data to guide and inspire progress. Most importantly, this project reinforces a powerful truth—nutritional care isn't just supportive; it's lifesaving. And with discipline, teamwork, and a local understanding of needs, it is fully within reach.

CONCLUSION

The ICU Enteral Nutrition Quality Improvement Project (QIP) at Deirdre General Hospital is a powerful example of how focused, team-led initiatives can transform patient care, even in resource-limited settings. Through a series of PDSA (Plan-Do-Study-Act) cycles focused on staff training, securing essential equipment, conducting daily multidisciplinary rounds, and conducting biweekly audits, the team dramatically improved compliance with enteral feeding protocols, from just **36.7% to 83%,** exceeding their original goal. But it wasn't just about the numbers. The real impact was seen in patient outcomes: **ICU mortality** decreased to **2%,** as more patients received the timely nutrition they needed to recover. One nurse shared, "Seeing fewer complications and more patients going home stronger—that's why we do this work." This project demonstrates that lasting change doesn't come from checklists alone. It comes from combining clinical discipline, compassion, and teamwork. The approach taken here provides a practical and inspiring model for other hospitals facing similar challenges, proving that even in difficult circumstances, innovation and commitment can lead to real, life-saving results.

LESSONS LEARNT

The Enteral Nutrition Quality Improvement Project in the Intensive Care Unit of Deder General Hospital, demonstrated that meaningful and sustainable change can be achieved even in resource-limited settings through structured, collaborative, and adaptable approaches. Using PDSA cycles, the team was able to implement data-driven improvements step by step. Staff engagement and leadership support were critical in overcoming resistance and integrating new protocols into daily practice. Low-cost solutions, such as standardized checklists and readily available equipment, helped fill resource gaps without compromising the quality of care. Transparent data sharing and ongoing feedback created a culture of accountability and sustainable progress. Most importantly, the focus on patient-centered strategies, such as daily education and personalized nutrition plans, improved compliance and brought a more compassionate, human touch to care, proving that small, thoughtful interventions can lead to life-saving outcomes.

MESSAGES FOR OTHERS

The experience at Deder General Hospital in Oromia, Ethiopia, shows that meaningful improvement in ICU care is possible even in resource-limited settings through commitment, simplicity, and teamwork. By using structured approaches like the PDSA cycle, complex problems can be broken down into manageable steps. Frontline staff play a vital role when equipped with the right tools, training, and a sense of ownership. Daily practices like multidisciplinary rounds and open feedback loops help sustain progress. Most importantly, seeing patients as partners ensures that their outcomes and stories remain at the heart of care. For hospitals facing similar challenges, start small, use data to guide action, and remember: every meal delivered on time is more than nutrition—it's a sign of hope, healing, and human dignity in motion.

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