Improving surgical quality in low and middle income countries: Why do some health facilities perform better than others? A longitudinal, mixed methods study in Tanzania's Lake Zone region

Noor Zanial, MS ; Shehnaz Alidina, SD, MPH; Pritha Chatterjee, MPH; Sakshie Alreja, BDS, ;David Barash, MD; Augustino Hellar, MD, MBA; Adelina Mazhiqi; Rahma Mushi, MD; Victoria Smith, MA; Mwita Wambura, PhD; Ntuli Kapologwe, MD, MPH, MBA-IHMd; Sarah Maongezi, MD, MPH

PROGRAM IN GLOBAL SURGERY AND SOCIAL CHANGE
Harvard Medical School

Abstract

Background: Evidence on uptake of surgical quality improvement interventions in(LMICs is limited. We studied the experiences of higher and lower performing facilities with the Safe Surgery 2020 program to identify potential factors distinguishing higher performers.

Methods: We used quantitative methods to identify higher and lower performing sites based on improvement on 14 surgical safety and culture indicators. Based on in-depth interviews with four surgical providers in every facility (n = 72), we used the constant comparative method to identify themes that differentiated the experiences of higher and lower performing facilities.

Results: As the intervention progressed, all facilities evolved along two interacting pathways: organizational culture and organizational learning. Several key themes distinguished the organizational culture and learning pathways for higher performers including collaborative teams, engaged leadership, and stronger learning structures. Higher performers capitalized SS2020 to improve their surgical ecosystem holistically while lower performers prioritized overhauling safety practices.

Conclusion: Effective interventions in LMICs must be cognizant of context, and tailored to the unique needs of facilities along the pathways of organizational culture and learning.

Introduction

- Improving access and quality of care in NCDs is a critical healthcare gap in the SDG era[1].
- Surgical care epitomizes this unmet need: 5 billion more surgeries needed globally; 143 million in LMICs[2]. Central and western sub-Saharan Africa have among the highest unmet surgical needs[3].
- Poor evidence on surgical quality from LMICs (single-center studies, no reporting of basic parameters[4]). Almost all existing surgical quality metrics are designed for HICs and very few for LMICs.
- There is a need to evaluate interventions better to understand heterogeneity of surgical intervention effects in LMICs[5,6].
- *To understand heterogeneity in the SS2020 experience, we hypothesized that the intervention facilities that performed better than others will highlight the best practices in implementation of a surgical quality improvement intervention.*

Methods

- **Study setting & intervention:** Lake Zone Region, Tanzania. SS2020 is a multicomponent intervention implemented over 9 months in 3 phases: changing culture (leadership training), building capacity (e.g. sterilization training), facilitating sustainability (e.g. mentorship).
- **Study design & sample:** In-depth qualitative study of 6 intervention facilities, drawn from a longitudinal quasi-experimental study of 20 facilities to explore factors that distinguish high-performing facilities using positive deviance framework.
- **Data collection:** Qualitative interviews conducted at baseline, midline and endline interviews with included facility leader & 3 surgical team members (n =108 interviews).
- Identification of higher and lower performing facilities through improvement in adherence to 14 safety, teamwork and communication indicators of the SSC.
- **Measurement of facility performance:** Stratified intervention facilities based on their improvement in safety and teamwork indicators measured by change in % points. Higher (n=3) and lower (n=3) performers were facilities with the most/least improvement in indicators.
- **Data analysis:** Constant comparison method of qualitative analysis used to develop themes to compare factors differentiating higher and lower performers. Inter-rater reliability of 0.85.

Results

Framework of Theory of Change

- An organization's starting context, comprised of its existing physical, cultural and learning structures, *set the foundation for its level and nature of engagement with SS2020,* and subsequent advancement.
- *All organizations*, irrespective of whether they were high or low performers, *evolved as they interacted with SS2020 interventions* along two interacting pathways: 1) organizational culture, 2) organizational learning.
- *Interactions imply one pathway cannot improve without the other.*
- Immediate changes in surgical culture and safety practices, were followed by efforts to sustaining these positive effects (example: building internal monitoring and evaluation). *Higher performers had moved on to sustainable changes, while lower performers were still implementing immediate changes*.
- Higher performers *overhauled surgical ecosystems holistically*, particularly by improving team structures, functions, communication and organizational learning. Lower performers *prioritized improving safety practices* and had just begun initiating change on these non-clinical aspects.
- *While also evolving, lower performers were behind higher performers on the change continuum*.

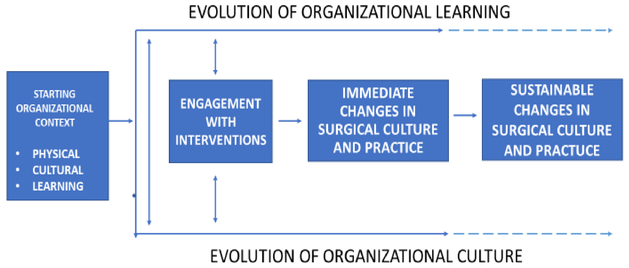

Figure 1. Emergent Themes

	Safety indicators pre-intervention	Safety indicators post-intervention	% Point Improvement in Safety indicators	Teamwork/communication indicators pre-intervention	Teamwork/communication indicators post-intervention	% Point Improvement in Teamwork/communication indicators
Higher performers						
Facility 1	33%	100%	67%	2.1%	93.2%	91%
Facility 2	45%	95%	50%	1.5%	99.8%	98%
Facility 3	12%	86%	74%	0%	75%	75%
Lower performers						
Facility 4	18%	63%	45%	0.3%	23%	23%
Facility 5	50%	61%	10%	0.70%	32.70%	32%
Facility 6	45%	59%	13%	0%	12.50%	12.50%

Table 1. Improvement in a) Safety Practices b)Teamwork and Communication

Conclusion

Safe Surgery 2020 provided facilities with the opportunity to not only improve their surgical practice but their surgical culture as well. Higher performers in the duration of the intervention demonstrated key qualities that differentiated them from lower performers: strong teamwork and commitment, collective learning, highly engaged leadership, and a willingness to improve surgical culture overall. In implementing interventions such as SS2020 it is important to make cultural assessments and tailor interventions to facility needs.

Discussion

- No difference between higher and lower performing facilities based on their physical resources or patient characteristics – except one important factor- higher performing facilities were smaller.
- Differentiation in starting conditions and evolution along two pathways – organizational culture and organizational learning, and the interaction between the two pathways.
- Surgical system strengthening efforts should focus not just on clinical interventions but on the prerequisites for organizational change[7].
- Supports literature about the importance of supportive leadership as an important predictor of successful implementation[8,9].
- Crucial to meet facilities where they are by starting with an assessment of organizational and cultural readiness for implementation, one size does not fit all for an intervention and there is a need to phase interventions tailored mentorship.
- Facilities should build a receptive implementation climate by building leadership support, engaging all stakeholders, following a multi-step implementation process, etc.
- Change takes time and resources and must allow time for implementing changes, reflection and collective learning.
- Limitations: Studied a small number of facilities; requires replication in other contexts, measurement of higher and lower performers was based on SSC, Hawthrone Effect, self-reported data.

Contact

Noor Zanial
Program in Global Surgery and Social Change
noor_zanial@hms.harvard.edu
+19097281837

References

1. Kruk M, Gage A, Arsenault C, et al. *High-quality health systems in the Sustainable Development Goals era: time for a revolution*. Lancet Glob Health 2018; 6: e1196–252. https://doi.org/10.1016/S2214-109X(18)30386-3
2. Meara J., Leather AJM., Hagander L, et al. *Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development*. Lancet 2015; 386: 569–624. http://dx.doi.org/10.1016/ S0140-6736(15)60160-X.
3. Rose J., Weiser T., Hider P. et al. *Estimated need for surgery worldwide based on prevalence of diseases: implications for public health planning of surgical services*. Lancet Glob Health. 2015 Apr 27; 3(Suppl 2): S13–S20. doi: 10.1016/S2214-109X(15)70087-2
4. Saluga S., Mukhopadhyay S., *Amundson JR, et al. Quality of essential surgical care in low- and middle-income countries: a systematic review of the literature*. Int J Qual Health Care. 2019 Apr 1;31(3):166-172. doi: 10.1093/intqhc/mzy141.
5. Bradley E. , Byam P., Alpern R., et al. *A Systems Approach to Improving Rural Care in Ethiopia*. PLOS ONE. April 25, 2012. https://doi.org/10.1371/journal.pone.0035042
6. Kruk M, Gage A, Arsenault C, et al. *High-quality health systems in the Sustainable Development Goals era: time for a revolution*. Lancet Glob Health 2018; 6: e1196–252. https://doi.org/10.1016/S2214-109X(18)30386-3
7. Bradley E. , Byam P., Alpern R., et al. *A Systems Approach to Improving Rural Care in Ethiopia*. PLOS ONE. April 25, 2012. https://doi.org/10.1371/journal.pone.0035042
8. Bradley E., Holombe E., Mattera J., et al. *The roles of senior management in quality improvement efforts: What are the key components? / Practitioner application*. Journal of Healthcare Management; Chicago Vol. 48, Iss. 1, (Jan/Feb 2003): 15-28.
9. Klein KJ and Knight A. *Innovation Implementation: Overcoming the Challenge*. SAGE ONE. Volume: 14 Issue: 5, page(s): 243-246. Issue published: October 1, 2005