



Scaling a simulation-based training methodology to build the competency of maternal and newborn health service providers across Nepal

Names of authors

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Background

Persistent gaps in quality of Maternal and Newborn Health (MNH) in Nepal

- Institutional deliveries have increased, but mortality reduction remains suboptimal
- MNH trainings in Nepal are largely theoretical, leading to:
 - Poor skills retention
 - Low confidence among service providers
 - Gaps in quality of care
- Evidence shows critical competency gaps among service providers (NSI, 2018).



What is simulation based education?

Simulation is the creation of an realistic artificial scenario of a real-world event/ cases wherein educational goals are achieved through experiential learning.

Benefits of simulation based education:

- Higher engagement and knowledge retention rates
- Enhances competency and self-confidence
- Allows controlled failure- learning from mistakes
- Facilitates feedback/ debriefing
- Ensures patient safety



Simulation Based Mentorship Program (SBMP) (2021 to 2023 AD)



Brief description of the SBMP program

- Pilot program conducted in Udayapur, Dolakha, Sarlahi and Myagdi
- Local level mentors were developed to provide regular mentorship using a Low Dose High Frequency (LDHF) approach in contrast to one time coaching in a long gap.
- There were 56 program sites/ Birthing Centers) (14 hub-sites and 32 sub-hub sites); simulation rooms established at 14 hub-sites
- 10 master trainers, 34 district level mentors developed
- An implementation research conducted to assess the Reach, Effectiveness, Adoption, Implementation, and Maintenance of the program using REAIM



Names of seven modules

S.N.	Sessions	Session duration
1	Module 1: Infection Prevention	1 day
2	Module 2: Antenatal care and counseling Module 7: Postnatal Care and Counseling	1 day
3	Module 3: Essential Care for Labor and Birth (ECLB)	2 days
4	Module 4: Helping Babies Breathe (HBB)	1 day
5	Module 5: Bleeding After Birth (BAB)	2 days
6	Module 6: Pre-eclampsia and Eclampsia (PE&E)	1 day



Simulation lab set-up

Hands-on learning environment

- Skills stations for 7 modules
- Manikins and equipment supported:
 - Mamabirthie
 - Mamanatalie
 - Mama U
 - Neonatalie
- HFOMC members engagement and orientation



Picture: A simulation lab set-up



Study Design- Quasi Experimental

Four districts

112 Birthing centers (BCs)- Purposive selection

56 intervention BCs
(14 hub sited and 42 sub-hub sites)

Baseline/ pre-assessment

SBMP Implemented

Midline/ 1st post-assessment

End-line/ 2nd post-assessment

56 control BCs

Baseline/ pre-assessment

SBMP not implemented

Midline/ 1st post-assessment

End-line/ 2nd post-assessment

Comparison

Comparison



Changes in skills assessment scores of intervention group participants (expressed in percentage)

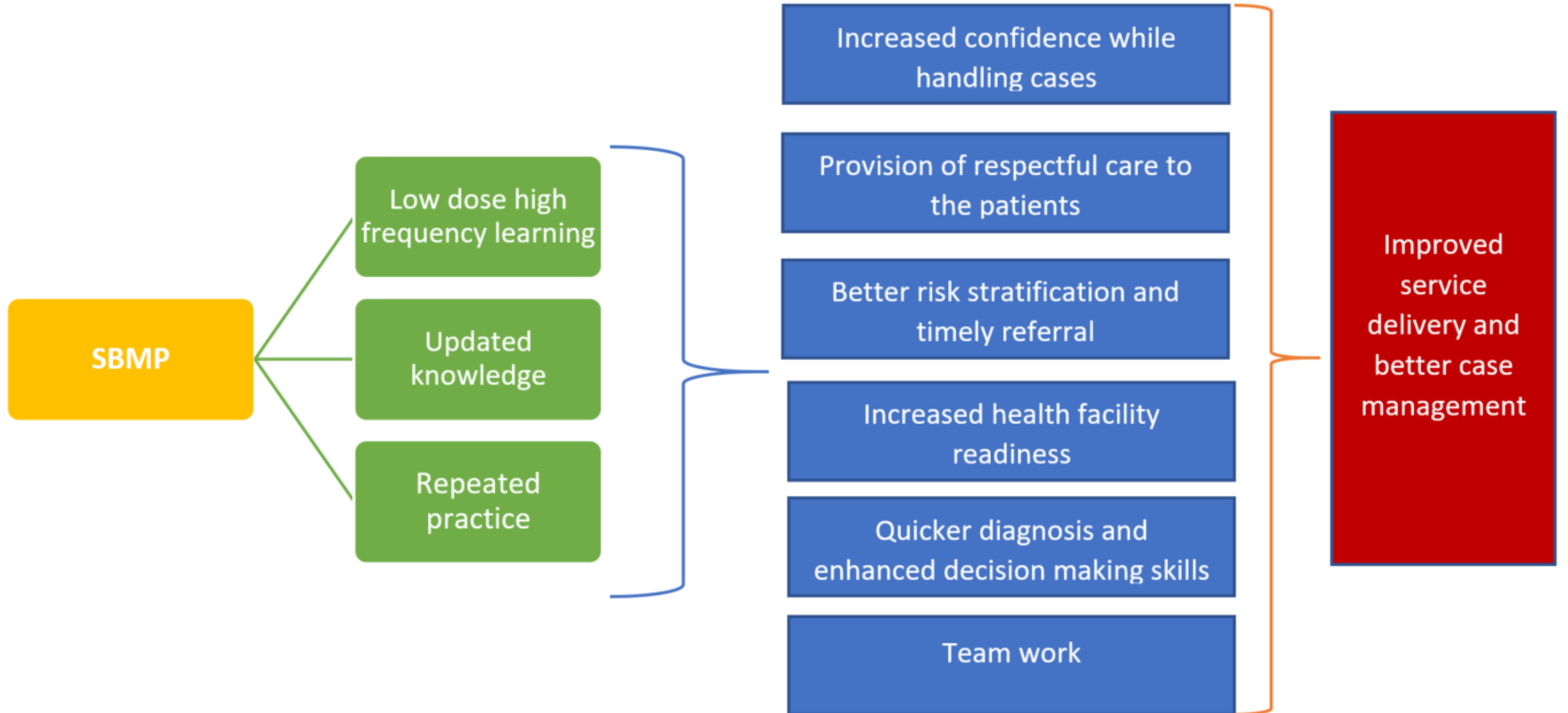
Modules	Obtained mean scores		Difference (E-B), 95% CI	P-value	Effect size
	Baseline	Endline			
Overall skills assessment score	42.2±15.1	92.5±5.0	50.3 [47.9, 52.7]	<0.001	3.6
Infection prevention	44.1±18.0	96.2±4.6	52.1 [49.2,55.1]	<0.001	3.0
ANC care and counselling	40.6±17.9	91.1±8.2	50.5 [47.4,53.6]	<0.001	2.8
Essential care of labor and birth	52.3±18.9	91.3±6.3	39.0 [35.7, 42.1]	<0.001	2.1
Helping baby breathe (HBB)	37.6±22.3	91.6±7.8	54.0 [50.4,57.5]	<0.001	2.6
Bleeding after birth complete(BAB)	36.9±19.9	91.4±7.0	54.5 [51.1,57.9]	<0.001	2.8
Preeclampsia and eclampsia	40.6±26.5	89.3±10.6	48.7 [44.4, 53.1]	<0.001	1.9
Module 7: PNC	37.2±20.3	90.5±7.9	53.3 [49.9,56.6]	<0.001	2.8

B: Baseline; E: Endline

Changes in knowledge assessment scores (expressed in percentage)

Modules	Control		Intervention		Univariate model	Multivariate model
	Baseline (n=120)	Endline (n=88)	Baseline (n=206)	Endline (n=133)	DID (95% CI)	Adjusted DID (95% CI)
Overall knowledge	63.2±8.8	71.7±9.6	66.8±10.1	89.9±9.2	14.5 [11.2,17.9]	14.6 [11.6,17.6]
Infection Prevention	73.5±11.2	75.8±11.6	75.9±13.1	91.8±10.1	13.6 [9.5,17.7]	13.60 [9.7,17.5]
Antenatal care and counselling	72.8±11.2	77.4±11.1	73.7±13.1	90.8±11.6	12.5 [8.2,16.7]	12.7 [8.5,16.8]
Essential care of labor and birth	60.5±14.1	69.9±15.0	64.8±14.5	91.3±12.6	17.2 [12.2,22.1]	17.2 [12.7,21.7]
Clinical decision making skills	61.5±22.0	69.1±22.1	67.6±21.6	89.0±17.8	13.9 [6.5,21.2]	13.6 [6.6,20.6]
Helping Babies Breathe	77.4±12.6	85.5±9.4	81.8±11.7	95.3±7.6	5.3 [1.5,9.1]	5.2 [1.6,8.8]
Bleeding after birth complete	62.9±14.0	74.1±14.4	67.2±15.1	91.4±10.8	12.9 [8.1,17.8]	13.1 [8.5,17.6]
Preeclampsia and eclampsia	41.2±10.4	53.6±14.8	44.7±15.8	82.8±15.5	25.7 [20.6,30.8]	25.9 [21.1,30.8]
Postnatal Care and Counselling	58.6±14.1	68.3±12.7	62.6±13.5	85.9±13.7	13.6 [8.9,18.4]	13.8 [9.1,18.5]

Perceived reasons for increased effectiveness



Strong consensus among the stakeholders, mentors, and mentees that the program should continue

“This program is supporting the Nepal government's goal of reducing maternal and newborn mortality rates. That is why this program must continue.” (Stakeholder 4)



Scale-up of SBMP (2023 AD till present)



Scale-up of SBMP (2023 till present)

- Program revised based on the learnings from the pilot study:
 - Increased duration between two training/ mentorship sessions
 - Virtual component added
 - Modules merged
- Expanded to all districts of Madesh and Karnali Province
- Simulation rooms established in 55 Birthing Centers till 2025



Integration of Simulation based methodology into National Health Systems

- Evidence from the pilot has informed the systematic integration of best practices into SHP/SBA modular training packages, ensuring greater standardization and consistency in training delivery.
- The Family Welfare Division is revising the SBA/SHP mentorship packages to integrate simulation-based approaches, strengthening clinical skills
- Simulation-based methodologies have been incorporated into the national training strategy to advance competency-based learning and enhance provider performance and service quality outcomes.



Implications

- Simulation-based training bridges the gap between knowledge and clinical practice, strengthening MNH systems.
- The LDHF approach supports continuous skill reinforcement and retention.
- Improves provider confidence, readiness, and quality of care.
- Demonstrates a scalable, context-appropriate model for Nepal.
- Aligns with national priorities to improve maternal and neonatal health outcomes.



Conclusion

- Simulation-based training is feasible, acceptable, and effective within the Nepal context.
- Evidence from SBMP implementation research demonstrates improvements in provider knowledge and clinical skills.
- Strong stakeholder ownership has been critical in enabling successful scale-up.
- Integration into national training systems reflects a strategic shift toward competency-based learning.



Way forward

- Institutionalize simulation-based LDHF training across MNH programs within national systems.
- Strengthen government ownership, including sustainable financing and policy integration.
- Expand simulation labs as Centers of Excellence to support quality training nationwide.
- Continue implementation research to inform adaptive learning and scale-up.
- Leverage digital and virtual platforms to enhance mentorship and supportive supervision.





One Heart
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Brief bio of the presenter

Name: Bhagawati Shrestha

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Bhagawati Shrestha brings over 18 years of experience in maternal and neonatal health (MNH). Since 2004, she has worked across hospitals and health facilities in Nepal, supporting the delivery and strengthening of MNH services in close collaboration with the government health system. Her work has focused on improving service readiness, building provider capacity, and advancing quality of care.

