Effectiveness and Implementation of Simulation Based Mentorship Program in four districts of Nepal

One Heart
WORLDWIDE

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Background

- Despite increased institutional deliveries and skilled attendance at birth, Nepal has not achieved the desired levels of reduction in maternal and neonatal mortalities.

- Critical gaps in knowledge and skills of existing maternal and neonatal health service providers in Nepal (NSI, 2018).

- The Simulation Based Mentorship Program (SBMP) was designed to fulfill the gaps in knowledge and skills of existing nursing staff working in different Birthing Centers.

- In this program, 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.

Brief description of the Simulation Based Mentorship Program (SBMP)

SBMP implemented districts
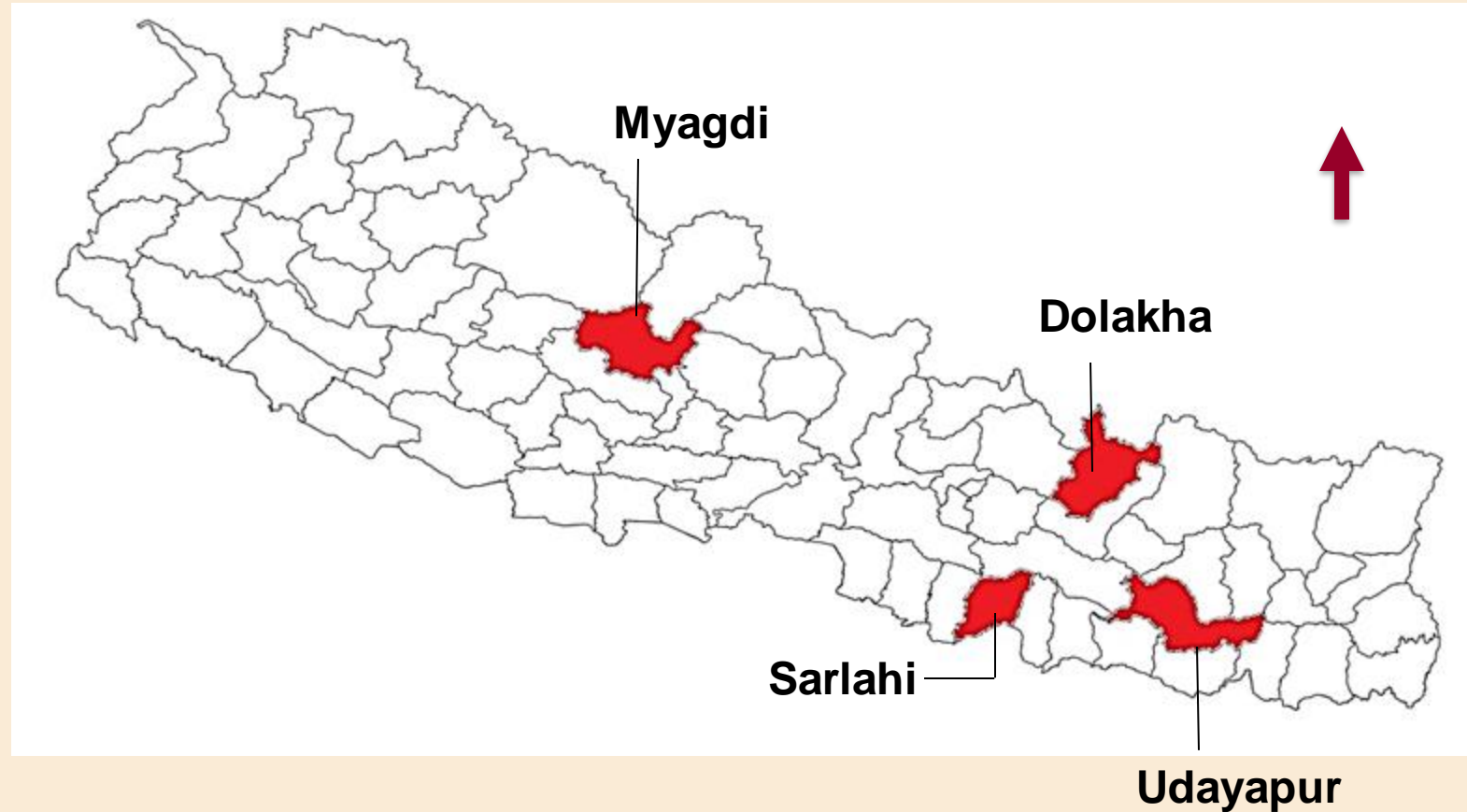
Udayapur and Dolakha (Baisakh 2078 to Kartik 2079)
Sarlahi and Myagdi (Chaitra 2078 to Jestha 2080)

Implementation of SBMP

Development of learning resource package

⬇

Master Training of 10 Trainers (MTOT)

⬇

Selection of 56 program sites (14 hub and 32 sub-hub Birthing Centers)

⬇

District level mentor development training (DTOT) (34 mentors)

⬇

Set-up of simulation labs at 14 hub sites

⬇

Monthly mentoring sessions to mentees (206 enrolled at baseline)

⬇

Weekly practice of module/s taught during monthly sessions

All the nurses and ANMs working in the birthing center at the time of first monthly session were selected as mentees

Names of monthly session and session duration

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

Selection of hub and sub-hub sites

- Selected during district and palika level planning meeting with stakeholders
- **Criteria for hub-sites**:
  - High delivery flow (more than 60 annual deliveries)
  - Space for skills lab/ simulation room set-up
  - Availability of mentors
- Each hub-site had 3 sub-hub sites. Sub-hubs were Birthing Centers (BCs) nearby the hub-sites having highest deliveries in the local level (except for the hub sites).
- 14 hub-sites and 42 sub-hub sites selected for program implementation.

Simulation lab set-up

- Skills stations
- Manikins and equipment for practicing seven modules supported.
- Names of manikins:
  - Mamabirthie
  - Mamanatalie
  - Mama U
  - Neonatalie
- HFOMC members were oriented and support materials were handed over

Picture: A simulation lab set-up

Figure- Simulation of Post Partum Hemorrhage (PPH)

Figure- Action cards

Study Objectives

- The main objective of the study was to assess the implementation and effectiveness of Simulation Based Mentorship Program (SBMP) using a RE-AIM framework (**R**each, **E**ffectiveness, **A**doption, **I**mplementation, and **M**aintenance).

REAIM dimensions in the study

REAIM Dimensions	Assessments done in the study
Reach	a. Number Birthing center intervened b. Number nurses trained as district level mentors c. Number of nurses (and ANMs) receiving the intervention
Effectiveness	a. Change in knowledge and skills b. Perceived reasons for program effectiveness
Adoption	a. Number of mentees participating in all 6 monthly sessions b. Number of mentees participating in weekly sessions c. Reasons for participation/ non-participation

REAIM dimensions in the study cont…

REAIM Dimensions	Assessments done in the study
Implementation	a. Plan Vs Actual implementation (fidelity) b. Perception regarding content, teaching and learning methods, and mentors c. Challenges encountered during implementation, adaptations made/ mitigation measures adopted
Maintenance	a. Perception regarding application of learnings in real setting b. Willingness to implement the program in the health facilities of SBMP implemented local levels after completion of SBMP c. Challenges and recommendations for continuation d. Cost required for continuation

RESEARCH METHODOLOGY

Specific type of study- Implementation research
Method- Mixed

Study Design- Quasi Experimental

Four districts

112 Birthing centers (BCs)- Purposive selection

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

56 control BCs

Baseline/ pre-assessment

Baseline/ pre-assessment

SBMP Implemented

SBMP not implemented

Midline/ 1st post-assessment

Comparison

Midline/ 1st post-assessment

End-line/ 2nd post-assessment

Comparison

End-line/ 2nd post-assessment

Study participants- Purposive selection

For quantitative assessments:
- All the nurses and ANMs working in Birthing Centers (BCs) (206 at intervention sites and 120 at control sites)
- At the intervention sites, the participants were also called mentees

For in-depth interview (58):
- Mentors- 14
- Mentees- 25
- Project staff from One Heart Worldwide- 10
- Local level stakeholders- 9

Data collection tools

S.N	Tools	Participants/ sites
1	Knowledge assessment questionnaire (structured multiple choice questionnaire in all 7 modules)	Intervention and control group
2	Skills assessment Checklist (observation in simulated setting)	Intervention group
3	Program cost entry sheet	Intervention sites
4	Log books	Intervention sites
5	Interview guide	Mentor, mentee, OHW staff, local level stakeholder

Approvals for the study: Family Welfare Division, Nepal Health Research Council (NHRC) (Reg. no. 47/2021)

Data management and analysis:

- Kobo application (for data entry)

- Stata 18 (Descriptive analysis, paired t-test, Difference in Difference linear regression- unadjusted and adjusted (age, education, job position, SBA training, work experience)

- Nvivo plus (thematic analysis)

Program at control sites

Three days simulation based on-site coaching and mentoring was provided on low scoring modules:

- Pre-eclampsia and Eclampsia (PE/E)
- Helping Babies Breathe (HBB)
- Essential Care for Labor and Birth (ECLB)
- Bleeding After Birth (BAB)

FINDINGS

Characteristics of Study Participants n (%)

Characteristics	Quantitative		Qualitative (n=58)
	Intervention (n=206)	Control (n=120)	
Age, in years (mean±SD)	30.5±7.3	30.6±8.4	33.2±7.7
Work experience, in years (mean±SD)	6.9±5.7	8.4±7.4	11.3±7.5
Education			
Auxiliary Nurse Midwives (ANM)	144(69.9)	100(83.3)	17(29.3)
Proficiency Certificate in Nursing	48(23.3)	19(15.8)	16(27.5)
Bachelors in Nursing	14(6.8)	1(0.8)	20(34.4)
Masters in Nursing	0(0)	0(0)	5(8.6)
Job position			
S/Auxiliary Nurse Midwives	163 (79.1)	112 (93.3)	30(51.7)
Staff Nurse	41 (19.9)	8(6.7)	7(12.1)
Nursing/Public Health inspector/Officer	2(1.0)	0 (0.0)	4(6.9)
Sub/Health coordinator	-	-	7(12.1)
Program staffs	-	-	9(15.5)
Job type			
Permanent	84(40.7)	59(49.2)	NA
Contract	122(59.2)	61(50.8)	NA

Number of nurses trained as district level mentors for SBMP

District	Number of nurses enrolled in the training	Number of mentors completing mentorship training (%)
Dolakha	7	7 (100%)
Myagdi	8	8 (100%)
Sarlahi	10	10 (100%)
Udayapur	9	9 (100%)
Total	**34**	**34 (100%)**

Number of nurses and ANMs receiving SBMP on all 7 modules

District	Number of nurses (and ANMs) enrolled in SBMP	Number of nurses (and ANMs) completing the intervention (%)
Dolakha	49	34 (69.4%)
Myagdi	35	27 (77.1%)
Sarlahi	63	42 (66.7%)
Udayapur	59	50 (84.8%)
Total	**206**	**153 (74.3%)**

Number of mentees doing all 4 weekly practice

Sessions	Total (n=206)
Infection Prevention	138 (67.0%)
ANC/PNC	133 (64.6%)
ECLB	142 (68.9%)
HBB	154 (74.8%)
BAB	133 (64.6%)
PE & E	151 (73.3%)

Perception regarding selection of mentees

Inclusion of both SBA and non-SBA trained nurses appreciated

"We have 3 SBA trained staff and we also have one staff member who is a non SBA. Previously, the non-SBA could not handle complicated cases. Now, one heart has provided this training (SBMP) to all the nursing staff, be it SBA or non-SBA. This training has helped in developing skills of both SBA and non-SBA trained staff of our health post." (Mentor 10)

Missed paramedics, doctors, new nursing staff, and office helpers

"Here, I am the only mentee and another sister could not participate in the training as she came short time after the simulation program started. There is also another ANM sister who is missed. I do share what I learned in the simulation training to them, but it won't be like same as that provided in the actual training." (Mentee 14)

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
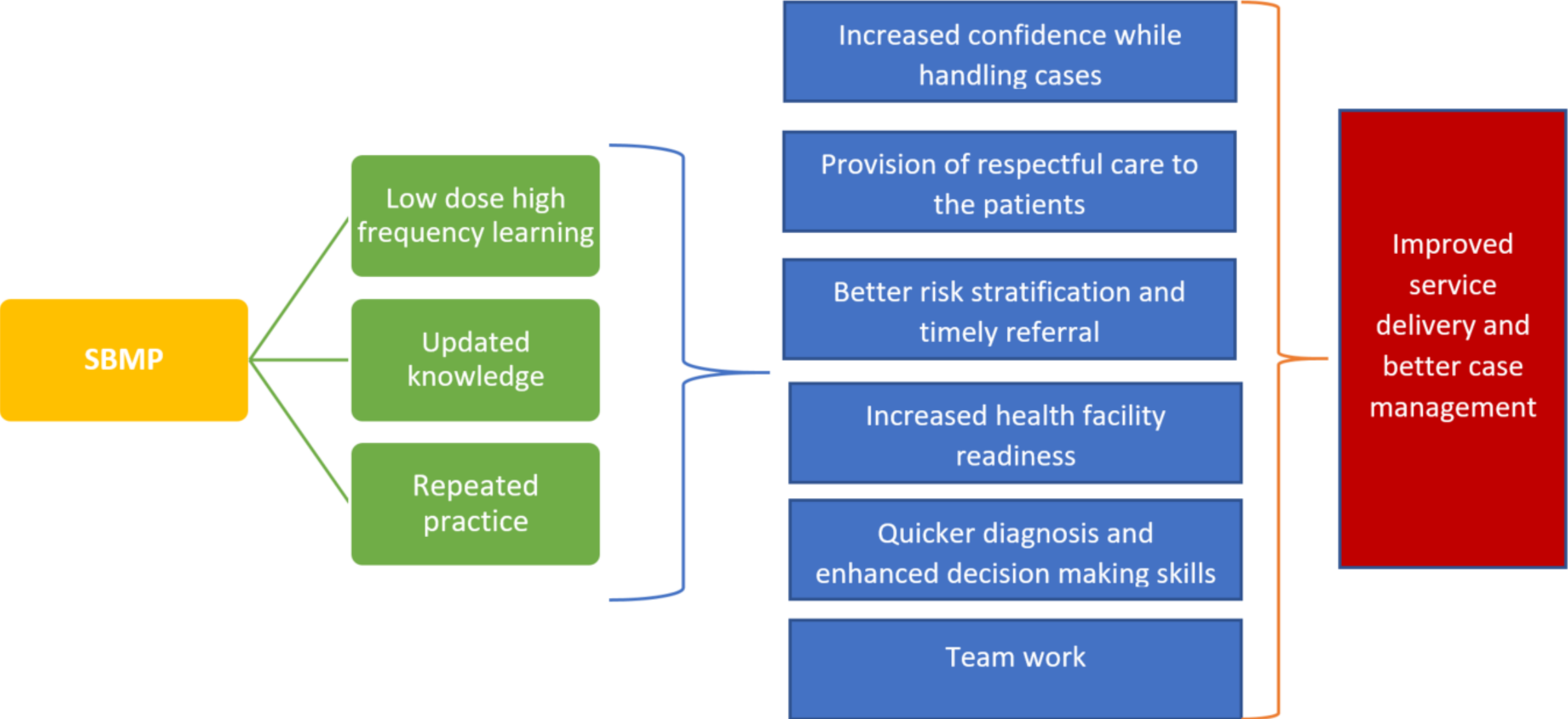
Average duration between two monthly sessions
(Planned- 28 to 32 days)

District	Average days
Dolakha	54.2
Myagdi	56.1
Sarlahi	46.9
Udayapur	62.2
Total	**54.9**

Perception about program components

Course content
- Comprehensive course structure
- Inclusion of new/ recent update and skills
- Knowledge and skills refreshed, confusions clarified
- Got to practice management of cases that are not received very often

Teaching and learning methodology
- Helpful action cards (also used in patient counseling)
- Realistic and durable manikins
- Experiential learning using simulation based approach
- Low dose high frequency method

Mentors
- Friendly and clarified confusions
- Did not find differences when taught by different mentors

Drop-out of mentors and mentees

Mentors	Baseline	Endline	Attrition from Baseline to endline (%)
Dolakha	7	5	2 (28.6%)
Myagdi	8	6	2 (25.0%)
Sarlahi	10	5	5 (50.0%)
Udayapur	9	4	5 (55.7%)
Total	**34**	**20**	**14 (41.2%)**

Mentees	Baseline	Endline	Attrition from Baseline to endline (%)
Dolakha	49	27	22 (44.9%)
Myagdi	35	23	12 (34.3%)
Sarlahi	63	36	27 (42.9%)
Udayapur	59	47	12 (20.3%)
Total	**206**	**133**	**73 (35.4%)**

Reasons for drop-out

Mentors
Transfer to another health facility– 2
Study leave - 6
Voluntary resignation or termination of contract -5
Maternity leave -1

Mentees
Transfer to another health facility– 19
Voluntary resignation or termination of contract of temporary staff- 40
Maternity leave -4
Study leave -4
Refused to participate- 6

Difficulties in program implementation after drop-out of mentors and mentees

- Difficulty in mentors' mobilization
- Challenges scheduling time for monthly session
- Delay in conduction of monthly sessions

"We had turnovers of mentors at 3 sites. One was transferred to another health facility and another one took postnatal leave after conducting two sessions. I then planned to mobilize mentor of other sites, but she refused saying that she had motion sickness. My one entire day was spent just searching for available mentors…" (Staff 4)

Challenges during conducting/ attending monthly and weekly sessions

Time management

- Work conflicts
- Staff scarcity
- High patient load and delivery cases
- Personal and other prioritized works

Weather extremes and geographical barriers

Covid pandemic

"Sometimes….we are participating in the training during duty time and we get a call saying a case has come. Then, we had to leave the training and handle the case. After handling the case, we again go back to the training, but we get confused." (Mentee 11)

"We have high patient flow here (health post), but we don't have adequate number of staff... I have to look at ANC and delivery cases at the same time." (Mentor 12)

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)

Cost of continuing SBMP by the local government

Cost of conducting one monthly session per health facility	NRs. 9,951.76
Cost of conducting all six monthly sessions per health facility	NRs. 59,710.55
Cost of SBMP training per mentee per session	NRs. 2,974.84

Perception regarding continuation of program by local levels

- SBMP aligns with other priorities of the local levels.

- Need guidance and requested for additional orientation and support in planning and implementation

- Feared difficulties due to lack of finances, staff shortage and high case load

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Conclusion and way forward

- Simulation Based Mentorship Program (SBMP) was effective in improving and retaining the knowledge and skills.

- Simulation based low dose high frequency approach could be a valid alternative for training MNH service providers to provide quality perinatal care.

- Simulation based methodology can be integrated with existing in-service and pre-service trainings.

Brief bio of the presenter

- Name: Nashna Maharjan
- Organization: One Heart Worldwide
- Designation: Senior Research and Learning Officer
- Education: B.Sc. Nursing; Masters in Health Promotion and Education (IOM, TU)
- Research interests: Implementation research; Maternal and neonatal health; and NCDs
- Experience in research sector: 7+ years