ORIGINAL ARTICLE

Impact of Training on Awareness and Knowledge of Service Providers About Maternal Near-Miss Events in Maharashtra, India

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Abstract

Objective To improve the awareness and knowledge regarding Maternal Near Miss (MNM) among health service providers in the selected districts and women's hospitals in Maharashtra, India.

Methods A one-day training programme on MNM was conducted at four Family Welfare Training Centres in the state of Maharashtra, India, for the health service providers, viz. gynaecologists, pathologists, anaesthesiologists, medical officers, staff nurses, other paramedical workers of the selected 29 districts/women's hospitals in Maharashtra. A total of 147 participants participated in the training programme. The participants filled a questionnaire before (pretest) and after the training (post-test) with the same set of questions pertaining to knowledge on the basic and operational aspects of MNM.

Results There was a significant improvement in the level of knowledge (post-test responses vs pretest responses) about the correct definition and classification of MNM, as per the instructions in the MNM-R guidelines by the Government of India.

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The service providers informed regarding the challenges in the implementation of the MNM-R guidelines at their hospitals such as shortage of manpower in terms of specialists and need of quality assurance.
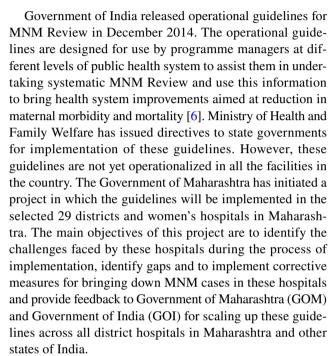
Conclusion The training programme improved the knowledge of the service providers about MNM, which would help them to implement the MNM-R guidelines effectively at their hospitals. This training effectively upgraded the knowledge level, and therefore, such trainings should be organized for all obstetricians, high-dependency unit (HDU) personnel and critical care teams.

Introduction

The maternal mortality ratio in India is declining over the past few decades. The MMR during 2014–2016 in India is reduced to 130/100,000 live births. There is a wide inter-state variation in MMR with the highest being in Assam (237) and lowest in Kerala (46). In Maharashtra, the MMR is 61/100,000 live births, which indicates that it has achieved the MDG goal in 2015 (109/1 lakh LB) [1]. However, it can still be reduced, and Government of India and the state governments have been implementing various programmes to reduce the MMR. In the continuum of normal healthy pregnancy to morbidity progressing to severe morbidity, near miss and death, the two ends of this continuum are easily identified and labelled; however, locating intermediate points is far more complex. It has been difficult to define clear threshold at which a woman can be reliably categorized as a severe morbidity or a near miss. Moreover, it is also difficult to identify the reasons for a woman to progress from one category to the next [2]. For many years, evaluation of maternal healthcare services for improving the quality of care has relied on review of maternal deaths internationally and nationally. In India, maternal death reviews are conducted at all the public health facilities to understand the causes of death. Maternal Death Review meetings are conducted to identify the causes and factors and to prevent such deaths in future. However, the service providers fear punitive action in such cases.

Over the past few decades, a concept of "near miss" has been of interest internationally and nationally for reducing the maternal mortality. WHO defines Maternal Near Miss (MNM) case as "a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy" [3]. Review of near-miss cases has the potential to highlight the deficiencies as well as the positive elements in the provision of obstetric services in any health system. Unlike in the developed countries, there is limited experience with the use of near-miss reviews as a tool for monitoring the quality of maternity services in developing countries [4]. Near-miss cases occur more often than maternal death and may generate more information because the woman herself can be a source of data [5].

Government of India released operational guidelines for MNM Review in December 2014. The operational guidelines are designed for use by programme managers at different levels of public health system to assist them in undertaking systematic MNM Review and use this information to bring health system improvements aimed at reduction in maternal morbidity and mortality [6]. Ministry of Health and Family Welfare has issued directives to state governments for implementation of these guidelines. However, these guidelines are not yet operationalized in all the facilities in the country. The Government of Maharashtra has initiated a project in which the guidelines will be implemented in the selected 29 districts and women's hospitals in Maharashtra. The main objectives of this project are to identify the challenges faced by these hospitals during the process of implementation, identify gaps and to implement corrective measures for bringing down MNM cases in these hospitals and provide feedback to Government of Maharashtra (GOM) and Government of India (GOI) for scaling up these guidelines across all district hospitals in Maharashtra and other states of India.

One of the important components of this project was to conduct capacity building workshops for sensitization and training of obstetricians, surgeons, anaesthetists, physicians and additional civil surgeons, matrons and other staff from each of the 29 districts and women's hospitals in Maharashtra. The objective of the present study was to improve the knowledge regarding MNM among health service providers in all 29 districts of Maharashtra, who could play a key role to identify MNM cases and find out the gaps, which are responsible for maternal near misses and maternal deaths. The present paper highlights the impact of training on awareness and knowledge of service providers in these hospitals about obstetric near-miss events in Maharashtra.

Materials and Methods

A one-day training programme was conducted to improve the level of knowledge of the participants regarding awareness about current statistics of MMR, knowledge about the basic aspects of MNM and maternal deaths, classification of MNM events as per guidelines and operational aspects of

MNM. Ethical approval (expedited review) was taken from the institutional ethics committee as the responses of the participants were completely anonymized.

The training programme had three components:

1. Development of training material and programme;
2. Conducting training programme; and
3. Assessment of the impact of training

Development of Training Material and Programme

The training material was developed after reviewing all the available national and international training materials on MNM. The major source was Government of India's MNM-R Operational Guidelines (December 2014). The training material and the programme were developed based on the content of operational guidelines of maternal near miss. The training material included Power Point presentations by experts, copy of MNM-R guidelines of Government of India released in 2014 including criteria for classification of these events and case studies on MNM.

Resource persons were belonging to the specialities of Public Health and Obstetrics and Gynaecology and also included officials from Government of Maharashtra.

Conducting Training Programme

A one-day training programme was conducted for the health service providers, viz. gynaecologists, pathologists, anaesthesiologists, medical officers, staff nurses and other paramedical workers of the selected 29 districts/women's hospitals staff in January 2018. A total of 147 participants participated in the training programme.

Before initiating the training programme, a learning environment where participants could feel free and comfortable to ask questions was created by the resource persons. The participants filled a 15-item questionnaire before (pretest) and after the training (post-test) with the same set of questions pertaining to knowledge regarding awareness, current statistics of MMR, basic and operational aspects of near miss, maternal deaths and classification of MNM events. The resource persons delivered training in the form of lectures with the help of Power Point presentations. Background

materials, copy of criteria and tools were provided to all the participants. Analysis was conducted on data aggregated using the Chi-square test; the difference between pre- and post-tests was examined for statistical significance.

The training programme included seven sessions. Session one covered the background, context setting, causes of MNM, understanding determinants, review of the current MNM and the objectives of the workshop. The second session focused on MNM definition, operational guidelines and criteria for identification. The third session included facility-based MNM-R format, operational issues in data collection/reporting, explaining the tool for MNM data collection and MNM-R register format. In the fourth session, participants were explained about Maternal Death Review (MDR)/MNM-R committee, reviewing MNM cases along with MDR in meetings, taking local corrective actions as per MNM findings and role of district and state MNM-R committees. It was followed by discussion, and question and answer session. The fifth session covered monitoring and analysis of gaps and action planning. Following this, group work was given to the participants in the form of case studies. The case studies included MNM cases, which helped the participants to understand the inclusion criteria as per the operational guidelines. Each group presented the case study, which was followed by discussion.

Assessment of the Impact of Training

At the end, to assess the impact of training, the participants were requested to fill in the post-training questionnaire. Data was entered and analysed using the SPSS software version 19.

Results

Pre- and post-test data were collected from 147 participants. Results before and after the training were compared for each question. The difference between pre- and post-test results was tested for statistical significance with Chi-square test.

Table 1 shows a significant improvement in the level of knowledge among the participants on awareness about current statistics of MMR in the post-training responses

Table 1 Awareness about the current statistics of MMR (N = 147)

S. no.	Topic	Test	Correct no. (%)	Incorrect no. (%)	No response no. (%)	P value
1	India	Pre	77 (52.4)	66 (44.9)	04 (2.7)	.000*
		Post	133 (90.5)	13 (8.8)	01 (0.7)	
2	Maharashtra	Pre	103 (70.1)	42 (28.5)	02 (1.4)	.000*
		Post	143 (97.3)	02 (1.4)	02 (1.4)	

*Significant

as compared to pre-training responses. The correct post-test responses increased by 38.1% in India and 27.2% in Maharashtra.

Table 2 shows a significant improvement in the correct knowledge of participants about the correct definition of MNM and the proportion of MNM cases as compared to maternal deaths. Though there was no significant improvement in the level of knowledge about the fact that causes for MNM and maternal deaths are same, there was a 6% increase in post-test responses as compared to the pretest responses. In addition, the level of knowledge in the pretest responses was quite high (81%).

Details regarding the level of knowledge regarding the classification of MNM events as per the guidelines are given in Table 3. There was a significant improvement in all the correct responses in post-training as compared to pre-training.

Details regarding the operational aspects of near miss in which there was a significant improvement in the correct response about year in which operational guidelines released by Government of India and awareness that the filled forms of MNM cases should be sent to Facility Nodal Officer [FNO] within 48 h of discharge of the patient are

given in Table 4. There was no significant improvement in the correct responses about responsibilities of MNM Review committee, about the point that same woman if admitted with MNM can be classified as MNM case twice and MDR committee functions as MNM Review committee in post-test responses as compared to pretest; however, there was an improvement in the level of knowledge in post-test responses as compared to pretest. In addition, the level of correct knowledge in pretest was quite high.

As part of the training programme, case studies on different aspects of MNM were discussed in groups. This was very beneficial, as the participants could understand the different scenarios and criteria under which the cases of MNM could be admitted.

The service providers were asked regarding the challenges in the implementation of the MNM-R guidelines at their hospitals. Important issues raised by them were availability of adequate manpower in the hospital in terms of specialists (gynaecologists and obstetricians, surgeons, anaesthetists, physicians; the obstetrician will need to check all the forms to assure quality; MDR committee should be formed at the divisional level, private hospitals

Table 2 Knowledge about the basic aspects of near miss and maternal deaths ($N=147$)

S. no.	Topic	Test	Correct no. (%)	Incorrect no. (%)	No response no. (%)	P value
1	Correct definition	Pre	115 (78.2)	31 (21.1)	01 (0.7)	.000*
		Post	135 (91.8)	08 (5.5)	04 (2.7)	
2	Causes for MNM and maternal deaths are same	Pre	119 (81.0)	25 (17.0)	03 (2.1)	.082**
		Post	128 (87.1)	19 (12.9)	00 (0.0)	
3	Proportion of MNM cases as compared to maternal deaths	Pre	55 (37.4)	62 (42.2)	30 (20.4)	.000*
		Post	96 (65.3)	36 (24.5)	15 (10.2)	

*Significant, **not significant

Table 3 Classification of MNM events as per the guidelines ($N=147$)

S. no.	Topic	Test	Correct no. (%)	Incorrect no. (%)	No response no. (%)	P value
1	Criteria for identification of MNM (minimum of three criteria)	Pre	100 (68.0)	37 (25.2)	10 (6.8)	.000*
		Post	126 (85.7)	10 (6.8)	11 (7.5)	
2	Inclusion of case as MNM if meets single-criteria cardiorespiratory collapse	Pre	93 (63.3)	48 (32.7)	06 (4.1)	.000*
		Post	136 (92.5)	09 (6.1)	02 (1.4)	
3	Inclusion of incidental and accidental as cause for MNM	Pre	103 (70.1)	35 (23.8)	09 (6.1)	.003*
		Post	126 (85.7)	19 (12.9)	02 (1.4)	
4	Hb levels for classification as MNM	Pre	43 (29.3)	91 (61.9)	13 (8.8)	.000*
		Post	120 (81.6)	24 (16.3)	03 (2.0)	
5	All cases of ectopic are classified as near miss	Pre	64 (43.5)	79 (53.7)	04 (2.7)	.000*
		Post	107 (72.8)	38 (25.9)	02 (1.4)	

*Significant

Table 4 Operational aspects of near miss ($N = 147$)

S. no.	Topic	Test	Correct no. (%)	Incorrect no. (%)	No response no. (%)	P value
1	Year in which operational guidelines released in India	Pre	76 (51.7)	66 (44.9)	05 (3.4)	.000*
		Post	136 (92.5)	11 (7.5)	00 (0.0)	
2	Responsibilities of MNM Review committee	Pre	129 (87.8)	11 (7.4)	07 (4.8)	.418**
		Post	134 (91.2)	10 (6.8)	03 (2.0)	
3	Same woman can be classified as MNM twice	Pre	104 (70.7)	33 (22.4)	10 (6.8)	.064*
		Post	120 (81.6)	23 (15.6)	04 (2.7)	
4	Filled forms FNO – 48 h	Pre	93 (63.3)	45 (30.6)	09 (6.1)	.000*
		Post	122 (83.0)	24 (16.2)	01 (0.7)	
5	MDR Committee functions as MNM Review committee	Pre	122 (83.0)	16 (10.9)	09 (6.1)	0.39**
		Post	135 (91.8)	10 (6.8)	02 (1.4)	

*Significant, **not significant

should also be involved and refresher contact sessions should be conducted for quality checks.

Discussion

The present paper highlights the pre- and post-test findings of the service providers regarding knowledge on MNM in 29 districts and women's hospitals in Maharashtra. To the best of our knowledge, there are several studies conducted on MNM in India and also globally [7–21] which indicate the prevalence, causes and other aspects of MNM; however, there are no such studies conducted in India or globally on knowledge of service providers on MNM and impact of training on this aspect.

In the present paper, the pretest and post-test findings of the participants indicate that there was a significant improvement in the level of knowledge in almost all the aspects of MNM such as current statistics of MMR, basic and operational aspects of near miss, maternal deaths and classification of MNM events. This would be very useful before the implementation of the MNM-R guidelines in all the 29 districts and women's hospitals in Maharashtra. The training empowered the service providers to understand the classification and record keeping of MNM cases as per the instructions in the MNM-R guidelines by Government of India. This would be useful for them to identify and classify the near-miss cases admitted to the hospitals correctly, regarding filling the questionnaire and sending the filled forms within the stipulated period to higher facilities. This would guide the programme managers to understand the causes of MNM, which are similar to maternal deaths.

The training improved the knowledge regarding responsibilities and the functions of the MNM committee and that MDR committee can also be entrusted the responsibility of functioning as the MNM-R committee. This would guide the service providers to merge these two committees at the district/women's hospitals so that the cases on MNM-R are reviewed every month, and the report of the committee is sent to the district MNM-R committee and the state MNM-R committee. The inclusion of case studies conducted by the participants in groups in the training programme was very beneficial, as they could understand the different scenarios and criteria under which the cases of MNM could be admitted. The feedback given by the participants would help the programme managers and the state officials to review these aspects before the guidelines are implemented at these hospitals in Maharashtra.

Thus, overall the training programme improved the correct knowledge of the service providers about MNM, which would help them to implement the MNM-R guidelines effectively at their hospitals. This training effectively upgraded the knowledge level, and therefore, such trainings should be organized for all obstetricians, high-dependency unit (HDU) personnel and critical care teams.

Compliance with Ethical Standards

Conflict of interest: None.

Ethical Approval Ethical approval (expedited review) was taken from the institutional ethics committee.

Informed Consent Waiver of informed consent was requested as the responses of the participants were completely anonymized.

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