

REVIEW ARTICLE

Maternal and child health handbook: Utilization and lessons learned from selected evidence-based studies

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Abstract

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The MCH handbook (MCHHB) is a home-based health record for both mother and child. It records the health condition of the mother throughout pregnancy, delivery, and the postnatal period, as well as the condition of the child such as immunization records and growth monitoring. This review addresses the various uses of MCH Handbooks in different selected countries since 1980. In addition, the objective is also to provide an updated overview of the lessons learned from selected evidence-based studies. Literature was reviewed using appropriate search terms in Pubmed and Ovid medline databases and narratively reported the findings of the included studies.

Studies from different countries on impact of MCH handbook showed that the intervention increased antenatal care (ANC) attendance, delivery with skilled birth attendants (SBAs) and delivery at a health facility, even after adjusting for maternal age, education and economic conditions. The qualitative data also indicated that the handbook was well received and culturally appropriate.

The MCH handbook is a reasonable and superior alternative to current card-type maternal records and also supportive to continuum of care to ensure better health for mothers and children.

Keywords: MCH handbook, maternal and child health, antenatal care, skilled birth attendants

Introduction

Among all Millennium Development Goals (MDGs), Goal 4 for children's health and 5 for women's health lag behind the other six MDGs significantly. To appreciate and speed up the progress toward achieving these two goals, the global health community now pays special attention to maternal, neonatal, and child health (MNCH).¹⁻⁵ Larger and more effective interventions and investment in MNCH are necessary to achieve these health-related MDGs⁶ though providing quality care during pregnancy and child delivery remain a major challenge.⁷ To fill these gaps, both demand and supply-side interventions are necessary.⁸ In this context, several countries adopted the Maternal and Child Health handbook (the MCH handbook) as a tool to promote better knowledge and service-seeking behavior among women.⁹ The MCH handbook is a home-based health record for both the mother and child. It records the health condition of the mother throughout pregnancy, delivery, and the postnatal period, as well as the condition of the child before, at, and after birth, including immunization records and growth monitoring. It also contains health education information related to MNCH. The handbook can be used to - monitor the health of a woman and her child, survey the utilization of health services, promote health education, and provide information when either mother or child is referred. The MCH handbook may empower women by facilitating greater participation in their own medical care.¹⁰

Current maternal and child health at glance in the world

According to CDC (2014)¹¹ the health of women and children is vital to creating a healthy world.

Despite great progress, there are still too many mothers and children dying—mostly from causes that could have been prevented. Every day, approximately 800 women die from preventable causes related to pregnancy and childbirth. 99% of these deaths occur in developing countries. In 2012, 6.6 million children died before age 5, and 5 million of them in the first year of life. Additionally, Asia-Pacific failed to meet the targeted goals for improving childhood nutrition and achieving universal health coverage. Despite not achieving universal health coverage, the proportion of live births without skilled birth attendance decreased by 36%, while the percentage of pregnant mothers without access to antenatal care (ANC) declined by 57% (MDG monitor, 2016). The MCH handbook may be an effective tool for communication with health providers and husbands, for both highly educated and less-educated women during their first pregnancy and will be able to assist in achieving MDGs beyond 2015.¹²⁻¹³ The objectives of this review are i) to evaluate the recent use of MCH Handbooks in selected 9 countries since 1980 and ii) to provide lessons learned from selected evidence-based studies.

Methods

Literature based secondary research was conducted using a combination of journal articles, books, online libraries Medline and Ovid, and conference proceedings from over 100 sources. The data was reviewed, verified and a narrative review was conducted to address research objectives.

Results

Recent uses of MCH Handbooks: country specific examples

Bangladesh

A key strategy in the government's growing effort to address maternal and child health is the implementation of the MCHHB since 2002¹⁴. In 2007, an operational field research study was conducted by the obstetric and Gynecological Society of Bangladesh (OGSB) at Maternal and Child Welfare centers (MCWCs) in four districts in four different divisions supported by JICA Bangladesh as a part of community-based safe motherhood project¹⁵. The study showed that 8 out of 10 mothers who had received the handbook believed that using the handbook could be a useful way to increase awareness among mothers about parents' health duties and responsibilities.

The pilot study from Bangladesh¹⁵ showed that pregnant mothers who received the handbook had more MCH information, better practices in MCH care, and higher utilization of MCH services than did the mothers in the control groups, who received only the health cards in general use in Bangladesh. There was no correlation between mothers' educational level, age, or economic condition and their use of handbook. Of mothers' who used the handbook, 9 out of 10 believed that the handbook system was a very easy method and that it would improve mothers' and children's health. Most (83%) of the mothers brought the handbook with them to consultations with healthcare providers with almost same number of mothers' were able to read the handbook and little less than these mothers' (76%) could write their comments in the handbook.¹⁵

Cambodia

Satoko and others (2015)¹⁶ performed a quasi-experimental study indicating the need for a study with a direct comparison between the handbook and other types of records as well as the effectiveness of the MCH handbook in Cambodia. They developed a Cambodian version of the MCH handbook that comprised the records and information mentioned in the preceding text and introduced it in two health centre catchment areas. Two other health centres were assessed as controls. The objectives of this study were to evaluate the impact of the MCH handbook on maternal knowledge and behaviour and to investigate the acceptance and feasibility of the handbook.

The Cambodian version of the MCH handbook was based on the Indonesian and Japanese handbooks.¹⁶ The trial version of the MCH handbook was then introduced to the participating centres in January 2008. Pre-intervention and post-intervention surveys were conducted with 320 women from the intervention areas and 320 women from the control areas who had given birth within 1 year before the survey. They evaluated the impact of the handbook by using difference-in-differences (DID) analysis and calculated adjusted odds ratios for pre–post changes in key indicators by using logistic regression. Logistic regression showed that the intervention increased ANC attendance, delivery with skill birth attendants (SBAs) and delivery at a health facility, even after adjusting for maternal age, education and economic conditions. The qualitative data indicated that the handbook was well received and culturally appropriate. Thus, the MCH Handbook is an acceptable and superior alternative to current card type maternal records.

Indonesia

There are approximately 22 million children below the age of five who currently reside in Indonesia (population 240 million).¹⁷ The infant mortality rate in Indonesia has decreased from 49 per 1000 live births in 1998, to 27 in 2010. Further, the maternal mortality ratio has decreased from 340 per 100,000 live births in 2000, to 220 in 2010.¹⁷ The national coverage of priority interventions has increased, including interventions providing a maternal, newborn, and child health (MNCH) continuum. However, the remaining coverage gaps in MNCH care indicate the need for maternal and child care to continue throughout the prenatal and postnatal periods¹⁸ to achieve the country's UN Millennium Development Goals (MDGs).⁸

Ministerial decree declared in 2004¹⁹, the 48-page Maternal and Child Health Handbook (MCHHB) the only home-based record of MNCH in Indonesia. Major professional, non-governmental organisations and development partners of the country have supported the handbook's use for a range of services. The MCHHB was piloted in 1993, and has been scaled up stepwise to accommodate the country's diversity.

A study done by Kusmayati and Nakamura (2007)²⁰ observed the relationships between MCHHB ownership and the utilization of various services such as antenatal care, tetanus toxoid (TT) immunization, family planning, and health personnel-assisted deliveries in a province where the MCHHB was intensively promoted. Analyses using the Indonesian Demographic Health Survey (IDHS) indicated associations between record ownership both before and after childbirth and health service utilization along the MNCH continuum. Such services include increased maternal care (i.e.

four antenatal care appointments, trained personnel assisted delivery, and care during the first postpartum week); 12 doses of child immunisations for seven diseases; and a continuum of immunization before and after childbirth (i.e. 12 doses administered during childhood, and two maternal doses of TT vaccine during pregnancy). However, the IDHS data did not distinguish the MCHHB from parallel records, so the implications regarding the association between MCHHB ownership and service utilization were limited to provinces where there was better access to services and MCHHB use was promoted.²¹ Osaki (2015)²² identified the direct contribution of the MCHHB toward MNCH service utilization through the analysis of nationally representative cross-sectional data from the Indonesia Basic Health Research (RISKESDAS) collected in 2007 and 2010, which indicates MCHHB ownership directly.²³⁻²⁴

Mongolia

Maternal and child health continues to present a significant public health challenge in Mongolia as well. Despite a marked improvement in the maternal and neonatal mortality ratios over the past 20 years, with 89.6 per 100,000 births in 2007²⁵ and 14 per 1,000 births during 2001–2003²⁶, respectively, as well as a decline in the mortality of older children,²⁵ the quality of antenatal care is still low.²⁷ Furthermore, complications during pregnancy remain a significant hurdle for improving maternal health in Mongolia.²⁸⁻²⁹ The purpose of introducing the handbook to Mongolia, which proposed by the Mongolian Ministry of Health, to increase antenatal visits and enhance client-provider communication during pregnancy to improve long-term health outcomes for mothers

and children. The handbook was first considered by the Mongolian government as a key intervention in maternal and child health in 2007,³⁰ and a study initiated the national adoption of the MCH handbook in Mongolia in 2010.³¹

A study conducted by Moni et al (2015)³² assessed the effectiveness of the Maternal and Child Health (MCH) handbook in Mongolia to increase antenatal clinic attendance, and to enhance health-seeking behaviors and other health outcomes. A cluster randomized trial was conducted using the translated MCH handbook in Bulgan, Mongolia to assess its effectiveness in promoting antenatal care attendance. The intervention group (253 women) attended antenatal clinics on average 6.9 times, while the control group (248 women) attended 6.2 times. Socioeconomic status affected the frequency of clinic attendance: women of higher socioeconomic status visited antenatal clinics more often. Pregnancy complications were more likely to be detected among women using the handbook.

Palestine

Palestine has used the MCH handbook as part of a national program since 2008. The Palestinian MOH attaches a high priority to improvements in MNCH, as early marriage and closely spaced births are common.³³ The infant mortality rate was 27.6 deaths per 1000 live births and the under-five mortality rate was 31.6 per 1000 live births for 2002–2006.³⁴ Despite the political instability and interrupted economic development, the infant mortality rate in Palestine was rather low.³⁵ Yet, the speed of the reduction in child mortality rates was slower than in other Middle Eastern countries such as the United

Arab Emirates.³³ The causes of infant mortality have changed from infectious and diarrheal disease in 1990–1994 to prematurity and congenital malformations in 2002–2006.^{33,36} Although estimates of the Maternal Mortality Ratio (MMR) are unreliable due to the absence of a well structured surveillance system for maternal deaths in Palestine, the speed of MMR decline is slower than the target reduction according to MDG5 (5.5 per cent decline per year).³⁷⁻³⁸

In Palestine, the coverage of antenatal care (ANC), delivery assisted by a skilled birth attendant (SBA), and child immunization is relatively high despite political instability and ongoing conflict.³⁴ Other indicators of the continuum of MNCH care, such as timely access for women in labor to health facilities, emergency obstetric care, adequate neonatal resuscitation, postnatal care (PNC), and family planning support, have low coverage.^{33,39} Timely access to health facilities suffers from mobility restrictions due to road blocks, checkpoints, and separation walls.⁴⁰ In Palestine's environment, the MOH expects the MCH handbook to play a powerful role in delivering effective MNCH care.

Hagiwara et al (2013)¹² examined the effect of the Maternal and Child Health (MCH) handbook – a home-based health record – on women's knowledge and behavior in the Jericho and Ramallah Governorates of Palestine. They used a repeated, cross-sectional data set in which pre- and post-intervention situations are incorporated on two groups: those exposed and those not exposed to the MCH handbook. Their findings were: knowledge related to MCH such as the importance of exclusive breastfeeding and how to cope with the risks of premature rupture of membranes during pregnancy increased among MCH handbook users,

especially among less-educated women. The MCH handbook may be an effective tool for communication with health providers and husbands, for both highly educated and less-educated women during their first pregnancy. They suggested that although less-educated women rarely read the handbook themselves at home, they became familiar with health information and options related to MCH through personalized guidance that was provided by health providers at health facilities utilizing MCH handbook.

Thailand

The MCH handbook has been recognized as an essential feature of the MCH aspect of the Thai primary health care (PHC) approach because it reflects and endeavors to apply at least five themes of the Alma-Ata declaration of PHC.⁴¹ Before 1985, each health program relating to the provision of mother and child health care had its own individual record card. The cards indicated only the specific services provided, with no other relevant MCH information. Therefore, in 1985 the department of Health, within the Ministry of Public Health, introduced the MCH handbook.⁴² From 1989 to 2008 the MCH handbook was periodically revised and updated to cover essential MCH developments and to meet the evolving needs of both providers and users.⁴³⁻⁴⁴

Isaranurug (2009)⁴⁵ reviewed the utilization of MCH handbook which is still less widespread than expected, especially among clients of private health services. This study also showed that although the Thai MCH handbook was developed and introduced 24 years ago, many studies have shown that its utilization, measured in several ways, has been relatively low.^{42-43,46-48} MCH handbook has primarily

been used in public sector health facilities only and currently being utilized at all level of health facilities. At present the MMR, IMR and child Mortality Rate (CMR) in Thailand are quite low compared to other ASEAN and SEARO countries. Thailand's overall coverage is over 90% for MCH services. However, the quality of care is not uniform at the various facilities. A study by Isaranurug and others (2006)⁴⁷ revealed that some MCH services were omitted and that communication between clients and health providers was less than optimal.⁴⁸ Accordingly, the handbook is an important tool to help ensure that clients obtain all basic MCH services. The Department of Health is giving high priority to this matter. In 2008 it launched a pilot project in five provinces, focusing on new ANC recommendation by WHO as well as the expansion the use of MCH handbook nation-wide.

Vietnam

Vietnam, one of the eight 'On-Track' countries in both Millennium Development Goals (MDGs) 4 and 5, marked a progress in reducing maternal mortality ratio by 78% from 233 per 100,000 livebirths in 1990 to 49 per 100,000 livebirths in 2013, and under-five mortality rate by 53 % from 51 per 1,000 livebirths in 1990 to 24 per 1,000 livebirths in 2013.⁴⁹⁻⁵⁰ Yet, these reductions have been achieved nationwide in a less equal manner. The discrepancies in both maternal mortality ratio and under-five mortality rate between provinces are significant. For instance, under-five mortality rate in Central Highland region (39.8) is 2.9 times and 1.7 times higher than respectively South East region (13.5) and national average (24).⁵¹ Similarly, maternal mortality ratio in North West Region (169) is 2.5 times higher than national

average (67).⁵² Thus, to reduce under-five-mortality rate and maternal mortality ratio, it is key to ensure adequately frequent antenatal checkups and access to neonatal and child health care services in the provinces where MCH services are less accessible.

To address these challenges, the Vietnamese Ministry of Health (MoH), in collaboration with Japan International Cooperation Agency (JICA), implemented the standardized MCH Handbook for its nationwide scaling-up, through its field-piloting in four provinces with different profiles (Dien Bien, Hoa Binh, Thanh Hoa and An Giang)⁵³ from 2011 to 2014. The standardized MCH Handbook was composed of a recording section and a guidance section for the respective maternal and child health stages, i.e. pregnancy, delivery, postnatal, newborn and childhood. As of 30 September 2014, a total of 552,204 pregnant women and mothers with infants registered at local commune health centers in the four provinces received and used the MCH Handbooks. Aiga et al (2016)⁵⁴⁻⁵⁵ showed that MCH Handbook contributed to the increase in pregnant women's practices of attending three or more antenatal care visits and in both knowledge and practice of exclusive breastfeeding.

Japan

In Japan, obstetricians have been obliged to fill in medical data on pregnancy and delivery in the MCHHBs. The majority of mothers (more than 70% in pilot study) have kept the handbook even when their children were adults. The MCHHB has been revised every decade since it started in 1948.⁵⁶ Even though the economic situation is poor, people can still enjoy healthy and happy lives. The joint

research team reached five possible explanations for Japan's low infant mortality rate; 1) narrow socio-economic distribution, 2) national health insurance, 3) the maternal and child health (MCH) handbook, 4) population-based screening and 5) health check-ups and high value placed on childbearing.⁵⁷

MCHHB data has also been used for different research questions for the betterment of maternal and child health. Matsuda and others (2016)⁵⁸ examined the possibility of screening apprehensive pregnant women and mothers at risk for post-partum depression from an analysis of the textual data in the Mother and Child Handbook by using the text-mining method. Kunugi and others (1996)⁵⁶ as well as Ohara (2010)⁵⁹ examined perinatal complications and schizophrenia data from the maternal and child health handbook in Japan. In addition, improvement of additional immunization rate is indicated as an important factor for effective immunization. According to Nakamura's study (2010)⁶⁰, in the 21st century, the MCH Handbook is reevaluated from the viewpoint of global health. The MCH Handbook program can guarantee the continuum care of maternal, neonatal and child health across time and location.

Korea

In Korea, the mother and child health handbook has been used partially since the 1960's and the government issued it for widespread use in Korea since July, 1987. As the mother and child health handbook was used mainly in the public health office, and different immunization handbooks were used by hospitals and clinics. Using the unified form of immunization handbook and extending compulsory vaccination report system might make it easier to get

a more accurate rate of vaccination.⁶¹

Kim and others (2012)⁶² studied the relationship between retention of mother and child health handbook and additional immunization rate of Japanese encephalitis and tetanus in Korea. Jeong (2004)⁶³ in one of his domestic studies, examined correlation between additional immunization and retention of the mother and child health handbook in women whose children were between 4 and 6 years old and located in 6 provinces of Gyeongsangnam-do in Korea, it was found that the whole retention rate of the mother and child health handbook was 76.7% and that the mother and child health handbook retention group had statistically significantly higher recognition and rate of additional immunization compared with their counterpart.⁶³

Lessons learned

1. The MCH handbook promotes continuous care and showed an increase in antenatal visits among the intervention group. The intervention will help to identify maternal morbidities during pregnancy and promote health-seeking behaviors.

2. The MCH handbook may be an effective tool to improve (i) communication between the client and the health provider and (ii) women's knowledge- and health-seeking behaviors related to maternal, newborn, and child health.

3. In Thailand as more and more people begin to access health care at private hospitals and clinics, the MCH handbook should be promoted, distributed and used in all types of health facilities throughout Thailand. The MCH handbook should also be included in the pre-service curriculum for all medical and

nursing students, to familiarize them with it before they begin to provide services to mothers and children.

4. In Vietnam, numerous home-based records for maternal and child health have been implemented in many parts of the country in a fragmented manner.⁵⁵ Therefore, it is an urgent task to standardize and integrate those currently existing home-based records into one. To address the issue, the Vietnamese MoH announced that the MCH Handbook piloted in the four provinces should be nationally scaled up as a single nationally standardized MCH home-based record, in August 2015. As MCH Handbook needs to be distributed to 1 million newly pregnant women per annum in the entire country, a national strategic plan for MCH Handbook operation should be carefully developed to ensure its operational sustainability.

5. The MCH handbook contents should be appropriate to community. Expanding the MCH handbook program and assuring widespread and effective utilization of the handbook will require training, excellent program management, and collaboration between program stakeholders including Government, NGOs, and professional and development partners. Sustainable development of the MCH handbook program could improve the quality of life of women.

6. In Cambodia The qualitative data indicated that the handbook was well received and culturally appropriate. Moreover, The MCH handbook is a reasonable and superior alternative to current card-type maternal records.

7. The MCHHB need some modification, taking into account the educational level of the targeted mothers. Appropriate health care provider training is needed to promote the use of the MCHHB as a

tool for encouraging and focusing communication between mothers and health care providers, as well as to ensure that health care providers are able to use the handbook.

8. In Indonesia²⁰ as the MCHHB enables the complete and efficient retention of MNCH records before and after childbirth, it can be an effective tool for promoting care continuity.

9. In Japan, it was suggested that the mother and child health handbook played a major role as a route to obtain immunization information.

10. In Korea, as the mother and child health handbook was used mainly in the public health office and different immunization handbooks were used by hospitals and clinics, using the unified form of immunization handbook and extending compulsory vaccination report system might ease to get more accurate rate of vaccination.

11. The MCH Handbook is an entry point for promoting maternal and child health.

12. In the 21st century, the MCH Handbook is reevaluated from the viewpoint of global health. The MCH Handbook program can guarantee the continuum care of maternal, neonatal and child health across time and location.

13. The MCH handbook is a reasonable and superior alternative to current card-type maternal records.

Discussion and Recommendations

The evaluation of the utilization and impact of MCH handbooks in 9 countries across Asia revealed varying practices and influences on the behaviour of mothers and children in these regions. In Bangladesh, studies showed that 80% of mothers using the hand-

book believe that the book increases awareness about the duties and responsibilities of a parent. 90% of mothers held the opinion that the handbook is user-friendly and would improve the health of mothers and children¹⁵.

The Cambodian version of the handbook was based on Japanese and Indonesian handbooks. Study showed that it has contributed for an increase in ANC attendance, delivery with SBAs and delivery at health facilities in Cambodia. The MCHHB was introduced in 1993 and studies in Indonesia using the Indonesian Demographic Health Survey (IDHS) indicated associations between MCHHB ownership both before and after childbirth and health service utilization showing improved maternal care and a continuum of immunization. However, data is limited to provinces where there was better access to services and MCHHB use was promoted²¹.

The purpose of introducing the handbook in Mongolia, proposed by the Mongolian MOH, was as a key intervention in maternal and child health. Since the adoption of the handbook in 2010, studies found that women in the intervention group attended antenatal clinics more frequently than the control group, and complications of pregnancy were more likely to be detected in women using the handbook. A Study by Hagiwara et al, in 2013¹² found that women exposed to the handbook had increased knowledge related to exclusive breastfeeding and how to cope with risks of PROM in pregnancy. It is also suggested that the MCHHB may be an effective tool to bridge communication between health care providers and husbands. The MCHHB in Thailand has been recognized as an essential feature in the Thai primary healthcare approach⁴¹. Furthermore, the utilization of the handbook

is still somewhat low in some countries and quality of care is not uniform across various facilities. Despite this, the handbook is considered to be an important tool to ensure that clients access all basic MCH services⁴⁴ Vietnam is one of the eight “On-Track” countries for MDG 4 and 5 and has made progress in reducing the MMR and under-five mortality ratios. A study by Aiga et al⁵⁴. showed that the MCHHB contributed to an increase in ANC visits, knowledge and practice of exclusive breastfeeding.

In Japan, mothers continue to retain the MCHHB event after their children reach adulthood and this has enabled MCHHB data to be used for many research questions. Another study by Nakamura et al. found that the MCHHB guarantees continuum of care for mothers and children across time and location⁶⁰. Though the MCHHB has been in use in Korea since the 1960s, it was issued for widespread use by the government in 1987. Regardless, the MCHHB has been utilized mainly in public health offices and thus, extending its use to hospitals and other clinics may contribute towards acquiring more data⁶²

Sustainable development of the MCH handbook will encourage safe motherhood by providing information on family health issues, prevention of diseases, and improved utilization of healthcare service facilities and eventually improve the quality of life of women. While there is room for improvement in the level of data recording in it, the studies from different countries indicated that MCH Handbook plays a catalytic role in ensuring a continuum of maternal, newborn and child health care.

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