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The Mother and Child Health Handbook in Japan as a Health Promotion Tool: An Overview of Its History, Contents, Use, Benefits, and Global Influence

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Abstract

Background. The Mother and Child Health Handbook (MCHH), a tool used by almost all parents in Japan, serves as a record book shared by parents and health providers to monitor maternal health care throughout the perinatal period, track the child's health and growth, and provide educational information. *Methods*. A review of the existing literature was performed by narrative review using electronic databases with the search term "Maternal and Child Health Handbook" from January 1980 to February 2016. *Results*. Twenty-eight papers were obtained: 3 review articles, 17 original articles, 2 brief reports, 2 letters, 1 research note, and 3 proceedings. After the MCHH was initiated in 1947, Japan's infant mortality rate decreased to 2.6 per 1000 live births in 2007, and it is still decreasing. Information recorded in the MCHH at antenatal examinations can be used to evaluate a child's risk of obesity, cardiovascular disease, endocrine disease, mental illness, and infectious disease. Utah's Department of Health implemented a program called "Baby Your Baby" in 1987 based on the Japanese MCHH; this included a similar booklet with family records and educational information. Thus, the MCHH is a unique tool in Japan that has influenced other countries to adopt similar programs. *Conclusion*. We will confirm the importance of the MCHH's role in promoting health and open dialogue.

Keywords

child health, health promotion, Infant mortality rate, Mother and Child Health Handbook, maternal health

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Introduction

The Mother and Child Health Handbook (MCHH) is a very important tool used by almost every parent in Japan. It has played traditional and important roles for approximately 70 years throughout Japan's maternal and child health history. The MCHH was initiated just after World War II, an era that lacked medical resources. Subsequently, it has played an important role in health promotion for mothers and children throughout wartime, postwar, the confusion era, and revival period in Japan.[1] The MCHH is used broadly in Japan today; however, its utility and originality is insufficiently recognized globally in the field of international maternal and child health.

Researchers will soon start to use health insurance data from the "My Number" individual number system and electronic medical record data as a form of big data. Then big data will be available for medical cooperation and study.[2] Such an information and communication tool can be applied in health care for expecting and nursing mothers.[3] However, health insurance data and electronic medical record data are associated with a high cost to compile. Therefore, the MCHH should be recognized as a traditional health tool from an era that lacked medical resources. In addition, the MCHH functions as

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a health education tool because it is self-administered. The MCHH can be used at a low cost. This knowledge may enable health care systems to deliver better maternal and child health in the future. The objective of this review article was to discuss the MCHH's history, contents, usage, benefits, and global influence based on existing literature.

Methods

A review of the existing literature was performed by narrative review using electronic databases such as PubMed, Ichu-Shi Web (a Japanese website), Google Scholar, and Google from February 2014 to March 2016. Searches were conducted to collect articles, brief reports, letters, and proceedings with "Maternal and Child Health Handbook" as the search term in English. We focused on the period from January 1980 to September 2015, the date of publication. The literature had to contain information regarding the MCHH's history, contents, usage, and benefits.

Two authors reviewed all full-text publications. Then we discussed information about the MCHH from the articles collected. Criteria for selection were the following: (1) the article contained the MCHH itself or acquired information from the MCHH, (2) the article contained primary or secondary information about the MCHH, and (3) the content satisfied the scientific validity and social utility requirements. The 2 authors discussed all the papers and each criterion throughout this process.

Results

Twenty-eight papers were obtained: 3 review articles,[4-6] 17 original articles,[7-23] 2 brief reports,[24,25] 2 letters,[26,27] 1 research note,[28] and 3 proceedings[29-31] (see Table 1). Additionally, all the articles were in English, and all the proceedings were from an international conference.

Discussion

MCHH's History in Japan

The MCHH was first initiated in 1947 in Japan, yet similar precursors were developed in the late 1930s.[26] In 1947, Japan's infant mortality rate (IMR) was around 76 per 1000 live births[4]; Japan's IMR in 1947 matched the IMR of developing countries at present; however, Japan's IMR is one of the lowest in the world today.[32] It was also about twice as high as the IMR of the United States, which was one of the lowest during the 1940s.[28] To reduce Japan's IMR, the Japanese government established the MCHH along with other support systems for mothers and children. After the MCHH was initiated, Japan's IMR steadily decreased. In 2007, it was reported to be at 2.6 per 1000 live births, and it is still decreasing.[4] This rate was even below the rate in the United States in 2007 (6.8 per 1000 live births).[29] Several researchers have evaluated the early recognition of a high-risk pregnancy for Japan's drastic improvement in infant health and the MCHH is almost always cited as one of the top reasons for this improvement.[5]

The MCHH has undergone several changes in its more than 68-year history. Its revisions and improvements have included different types of information, guidelines, and other tools. One of the largest changes came in 1991, when a law made each municipality responsible for updating and distributing the MCHH.[4] The new law allowed individual cities to add information relevant to their specific areas to make the MCHH more appropriate to resident mothers. Personalized books for each municipality served as a model for when the MCHH went global, and they allowed for similar customization.[30]

Although the MCHH accomplishes its objectives in individual cites in Japan, Indonesians began to use the MCHH and attempted to distribute a similar resource in its own country. Commencing with Indonesia, use of the MCHH spread worldwide and it came to be used in many countries. Consequently, many of the MCHHs designed by countries outside of Japan include illustrations with many colorful pictures to ensure that the information can be understood easily by illiterate parents.[30]

Contents of the MCHH

The MCHH consists of 2 sections. The first section serves as a record book shared by both parents and health care providers to monitor maternal and child health. The record section includes information about the mother's condition during pregnancy, such as her body size, blood pressure, proteinuria, urinary sugar, and other data. It also includes the child's developmental milestones, vaccination records, and health history throughout early childhood. This record book is given to health providers and parents to monitor maternal health throughout pregnancy/delivery and the child's health and growth until school age (around 6 years in Japan).[31] Although the record book is only updated through age 6, many parents retain the MCHH well into the child's adult years.[5]

The second section of the MCHH consists of educational information for parents to read and follow during pregnancy and early child rearing. The information section includes dietary recommendations and health care

Table 1. Reviewed Papers About the Mother and Child Health Handbook (MCHH).

No.	Reference No.	Author	Title	Type of Manuscript	Role of the MCHH	Study Design	Cited Paper	Searching Tool[a]	Year of Publication
1	28	Matsuyama	Japan shows how to save the children	Research note	As part of maternal and child health	Narrative review	*Japanese Organization for International Cooperation in Family Planning Review*	PubMed and Google Scholar	1987
2	26	Mamiya	Japan's Maternal and Child Health Handbook	Letter	Introduction of the MCHH itself	Narrative review	*Midwives Chronicle & Nursing Notes*	PubMed and Google Scholar	1990
3	5	Takayanagi et al	The Role of the Maternal and Child Health Handbook system in reducing perinatal mortality in Japan	Review article	As part of maternal and child health	Narrative review	*Clinical Performance and Quality Health Care*	PubMed and Google Scholar	1993
4	6	Leppert	An analysis of the reasons for Japan's low infant mortality rate	Review article	As part of maternal and child health	Narrative review	*Journal of Nurse-Midwifery*	PubMed and Google Scholar	1993
5	11	Kunugi et al	Perinatal complications and schizophrenia. Data from the Maternal and Child Health Handbook in Japan	Original article	As material to acquire information	Cross-sectional study	*Journal of Nervous and Mental Disease*	PubMed and Google Scholar	1996
6	12	Ohara et al	Obstetric complications in siblings of Japanese schizophrenics: data from the Maternal and Child Health Handbook	Original article	As material to acquire information	Case-control study	*Progress in Neuro-Psychopharmacology & Biological Psychiatry*	PubMed and Google Scholar	2005
7	13	Tsuchiya et al	Advanced paternal age associated with an elevated risk for schizophrenia in offspring in a Japanese population	Original article	As material to acquire information	Case-control study	*Schizophrenia Research*	PubMed and Google Scholar	2005
8	27	Takagai et al	Increased rate of birth complications and small head size at birth in winter-born male patients with schizophrenia	Letter	As material to acquire information	Case-control study	*Schizophrenia Research*	PubMed and Google Scholar	2006
9	19	Kusumayati et al	Increased utilization of maternal health services by mothers using the Maternal and Child Health Handbook in Indonesia	Original article	Target of study	Repeated cross-sectional study	*Journal of International Health*	Ichu-Shi Web and Google Scholar	2007

(continued)

Table 1. (continued)

No.	Reference No.	Author	Title	Type of Manuscript	Role of the MCHH	Study Design	Cited Paper	Searching Tool[a]	Year of Publication
10	24	Tsuchiya et al	Decreased serum levels of platelet-endothelial adhesion molecule (PECAM-1) in subjects with high-functioning autism: a negative correlation with head circumference at birth	Brief report	As material to acquire information	Case-control study	*Biological Psychiatry*	PubMed and Google Scholar	2007
11	14	Tsuchiya et al	Paternal age at birth and high-functioning autistic-spectrum disorder in offspring	Original article	As material to acquire information	Case-control study	*British Journal of Psychiatry*	PubMed and Google Scholar	2008
12	31	Toyama	Maternal and Child Health Handbook Program in Japan	Conference proceedings	Introduction of the MCHH itself	Narrative review	The 6th International Conference on Maternal and Child Health (MCH) Handbook	Google	2008
13	29	Nagata	The Maternal and Child Healthcare Handbook in Utah, USA	Conference proceedings	Introduction of the MCHH itself	Narrative review	The 6th International Conference on Maternal and Child Health (MCH) Handbook	Google	2008
14	30	Osaki	MCH Handbook and International Collaboration	Conference proceedings	Introduction of the MCHH itself	Narrative review	The 6th International Conference on Maternal and Child Health (MCH) Handbook	Google	2008
15	25	Osaki	Investment in home-based maternal, newborn and child health records improves immunization coverage in Indonesia	Brief report	Target of study	Cross-sectional study	*Transactions of the Royal Society of Tropical Medicine and Hygiene*	PubMed and Google Scholar	2009
16	4	Nakamura	Maternal and Child Health Handbook in Japan	Review article	Introduction of the MCHH itself	Non–systematic review	*Japan Medical Association Journal*	Ichu-Shi Web and Google Scholar	2010
17	10	Tanabe et al	Association of women's birth weight with their blood pressure during pregnancy and with the body size of their babies	Original article	As material to acquire information	Case-control study	*Tohoku Journal of Experimental Medicine*	PubMed, Ichu-Shi Web, and Google Scholar	2011
18	7	Kouda et al	Relationship between body mass index at age 3 years and body composition at age 11 years among Japanese children: the Shizuoka population-based study	Original article	As material to acquire information	Cross-sectional study	*Journal of Epidemiology*	PubMed, Ichu-Shi Web, and Google Scholar	2012
19	20	Baequni et al	Is maternal and child health handbook effective? Meta-analysis of the effects of MCH Handbook	Original article	As material to acquire information	Meta-analysis	*Journal of International Health*	Ichu-Shi Web and Google Scholar	2012

(continued)

Table 1. (continued)

No.	Reference No.	Author	Title	Type of Manuscript	Role of the MCHH	Study Design	Cited Paper	Searching Tool[a]	Year of Publication
20	8	Fujita et al	Association of rapid weight gain during early childhood with cardiovascular risk factors in Japanese adolescents	Original article	As material to acquire information	Cross-sectional study	*Journal of Epidemiology*	PubMed, Ichu-Shi Web, and Google Scholar	2013
21	9	Aoyama et al	Does cardiorespiratory fitness modify the association between birth weight and insulin resistance in adult life?	Original article	As material to acquire information	Cross-sectional study	*PLoS One*	PubMed and Google Scholar	2013
22	15	Takeuchi et al	Influence of vaccination dose and clinico-demographical factors on antibody titers against measles, rubella, mumps, and varicella-zoster viruses among university students in Japan	Original article	As material to acquire information	Case-control study	*Japanese Journal of Infectious Diseases*	PubMed, Ichu-Shi Web, and Google Scholar	2013
23	18	Mori et al	Effectiveness of influenza vaccine in children in day-care centers of Sapporo	Original article	As material to acquire information	Case-control study	*Pediatric International*	PubMed, Ichu-Shi Web, and Google Scholar	2014
24	16	Takeuchi et al	Serological assessment of measles-rubella vaccination catch-up campaign among university students	Original article	As material to acquire information	Cross-sectional study	*Pediatric International*	PubMed, Ichu-Shi Web, and Google Scholar	2014
25	17	Takeuchi et al	Social regulations predispose people to complete vaccination for vaccine-preventable diseases	Original article	As material to acquire information	Case-control study	*Tohoku Journal of Experimental Medicine*	PubMed, Ichu-Shi Web, and Google Scholar	2014
26	22	Mori et al	The Maternal and Child Health (MCH) handbook in Mongolia: a cluster-randomized, controlled trial	Original article	Target of study	Cluster-randomized controlled trial	*PLoS One*	PubMed and Google Scholar	2015
27	23	Kawakatsu et al	Effectiveness of and factors related to possession of a mother and child health handbook: an analysis using propensity score matching.	Original article	Target of study	Observational Study using propensity score matching	*Health Education Research*	PubMed and Google Scholar	2015
28	21	Yanagisawa et al	Effect of a maternal and child health handbook on maternal knowledge and behaviour: a community-based controlled trial in rural Cambodia	Original article	Target of study	Community-based controlled trial	*Health Policy and Planning*	PubMed and Google Scholar	2015

[a]When we searched in Google Scholar, we omit Google.

provider's home visit records. It compiles and reports on the environment of child care support for infants 4 months after childbirth (eg, Hello Babies Services) and provides guidance for early child rearing.[33] Appointment reminder cards for health checkups and child development monitoring activities are included.[29] Every resource in the book is intended to educate parents, allowing them to make informed decisions during the perinatal period and child development. The information enables parents to evaluate their children for early signs of disease, suggests when they should have regular checkups, and provides advice about general child rearing. The information section also facilitates dialogue between parents and health care providers. An informed parent understands what signs a health care provider looks for during checkups, and aids in spotting abnormalities, so they can seek medical assistance much sooner, allowing for faster treatment of ailing children.

MCHH's Use and Benefits as a Monitoring Tool, Material for Research, and Open Dialogue

The MCHH is not solely responsible for Japan's low IMR. Studies cite several other reasons as to why Japan has the lowest IMR in the world, which includes the Japanese government's resources and funding, cultural emphasis on community involvement with child rearing, an impressive literacy rate, and high rate of residents with college and professional degrees.[5,28,33] Experts say that the combination of these factors make Japan undoubtedly capable of taking care of its child population.[28,33]

However, because of its record-taking capabilities, the MCHH remains one of the leading tools. For instance, for pregnant woman who undergo medical examinations, illness and complications can be recorded. This medical continuity allows for the safekeeping of records, references at every consultations, and information sharing by an introduction letter and course records. With the help of the MCHH, health care providers can also prescreen mothers for certain diseases. The MCHH has been used to record gestational diabetes mellitus, as there is also a higher risk to the child.[5] Additionally, since many parents carry the book and use it, the MCHH serves as a resource for child health studies.

The following research touts the benefits of having access to clinical data from Japan's MCHH. First, the MCHH records a child's body size. These data can be used to monitor a child's risk for obesity, cardiovascular disease, and endocrine disease.[6,8,9] Additionally, the MCHH can record body size not only at birth but also at ages 1.5 and 3 years during health examinations.[6,8] A longitudinal investigation can perform a more detailed risk assessment, including information such as the body composition in later years.[8] Future studies can evaluate the association between using 2 generations of birth weight recorded by the MCHH.[10] Thus, data from the MCHH may be used for assessing linkage similarities between generations.

Second, in addition to body size, pregnancy, and birth complications, the paternal age and gestational period recorded in the MCHH are used for research on schizophrenia, as studies have suggested an association between perinatal data and schizophrenia.[11-13,27] Biological factors such as perinatal data are needed to evaluate the cause of schizophrenia. Data from the MCHH, such as head circumstance and paternal age, are also required for research about developmental disorders.[14,24] Furthermore, perinatal information can be used in genome epidemiologic investigations of mental disorders. It is expected that the cause of mental disorders will be clarified by both information about the human genome sequence and the environment.

Finally, the MCHH includes information about attribution and perinatal events. These factors are used as adjusting confounding factors (eg, birthplace, gestational week, and neonatal asphyxia) in research about preventing infectious disease.[15] Moreover, vaccination coverage can be the main outcome in research studies by using the vaccination history from the MCHH.[16-18] Vaccination history is important, as it can record the immunity status for preventing infectious disease.

If a study would require the incidence of a certain illness in children in a geographic area, a review of the MCHH would allow researchers to quickly acquire the necessary information; other means would be costly and time consuming. The MCHH also allows parents to more accurately and easily find the information for such studies without having to rely on their memory or make inquiries to health care providers regarding medical records. Thus, the MCHH enables researchers to better conduct research on maternal and child health.

Resources in the MCHH also allow health providers and parents to collaborate. This is due, in part, to the early recognition of problems and the open dialogue between patients and their health care providers. The MCHH is a monitoring tool shared by parents and health care providers; thus, it has a positive effect on infant health since problems can be recognized early.

Global Influence of the MCHH: Programs and Assessment in Other Regions

The health benefits and reduction in the IMR resulted from a similar program in the United States. Utah's

Department of Health implemented a program called "Baby Your Baby" in 1987.[29,34] This program, partially based on the MCHH in Japan, includes similar resources such as a booklet with family records and educational information. Similar to the MCHH, the original "Baby Your Baby" booklet was designed to accompany expecting mothers at each doctor visit so that children's health care could be recorded starting at pregnancy. The booklet tracked immunizations, and it included questions for mothers to ask their health care providers and 2 appointment reminder postcards for each mother. As of 2008, "Baby Your Baby" was the only program in the United States that was similar to the MCHH, and the results may be associated with its effectiveness. One year after the program was initiated, Utah recorded the largest decrease in the IMR in state history (from 8.8 to 8.0 per 1000 live births). As of 2007, Utah's IMR was 5.2 per 1000 live births, making it the state with the lowest IMR in the United States (6.8 per 1000 live births).[29] This success may be due to Utah's high rate of individuals with college and professional degrees.[35]

How did this program have such a beneficial impact on the IMR? Considering that the "Baby Your Baby" program did not change or add any other resources or maternal health systems, the decrease in the IMR may be attributable to the increased availability of educational materials and record keeping generated by the program. Parental consciousness of the early signals of disease and understanding the importance of health monitoring may be significantly advantageous to a child's health. Additionally, collecting all of a child's health records in one place makes it easier for the parents and health professionals to provide appropriate and efficient care.

The "Baby Your Baby" program is an example of how the MCHH in Japan can be adopted in another country. However, Utah is not the only place to have successfully adopted such a program. Many countries with previously high IMRs have adopted similar programs, and all of them have indicated a decrease in the IMR as a result.[29] Countries that have successfully adopted the MCHH include Cambodia, Bangladesh, and Indonesia.[20] Several articles have discussed the outcomes in relation to the MCHH's utility.[19-21] The results of these articles indicated usage, literacy, and perinatal care by mothers as being a part of the MCHH's utility. However, the subjective outcomes outlined in these articles are problematic. Similar to previous Japanese studies, a follow-up vaccination coverage survey in developing countries can be expected with the use of the MCHH.[16-18,25] Even developing counties that have limited medical resources can record data more objectively with the MCHH than without it. Nonetheless, it is necessary to assess the causal validity before and after distributing the MCHH. This type of study would obtain more causal validity to control for confounding factors.[22,23] Additionally, these articles clarify the actual adaption of distributing the MCHH overseas. To develop the MCHH's outcome research internationally, the MCHH must be assessed using more comprehensive surveys.

The use of books like the MCHH can suggest its own effectiveness. The international success of MCHH-like programs indicates how it can be used as a tool to help support parents and children worldwide, and it suggests that this Japanese program is an example for other health care systems to emulate.

Limitations

Our searches were conducted to intentionally collect certain articles and proceedings and were populated with preferred reporting items for systematic review and meta-analysis protocols.[36] Because of our selection strategy, we may not assess some publication biases in these search results as compared with a systematic review.

Conclusions

The MCHH has contributed to positive outcomes, such as the decrease in the IMR, by providing both health records and education to expecting mothers. Although the MCHH was originally a unique tool designed by Japanese medical professionals, various other countries have adopted similar programs that have provided comparable beneficial results, which further support the adoption of this tool. Its implementation in some countries may require further modification to account for social differences between those countries and Japan. For instance, the United States has a much higher divorce rate and many immigrants, which may be complicating variables. However, the adoption of programs similar to Japan's MCHH may improve IMRs and solve problems, such as the public's access to important medical information, which may lead to better overall health for mothers and children. In the near future, the MCHH may become an electronic tool accessed online via a cloud-based system. We will confirm the importance of the MCHH's role as a promotion tool for health and open dialogue before the era of the electronic database society.

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Author Contributions

JT: Contributed to conception and design; contributed to acquisition and interpretation; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.
YS: Contributed to conception and design; contributed to interpretation; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.
RCP: Contributed to interpretation; drafted manuscript; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

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