

## DIMENSIONS OF WOMEN'S EMPOWERMENT AND THEIR INFLUENCE ON THE UTILIZATION OF MATERNAL HEALTH SERVICES IN AN EGYPTIAN VILLAGE: A MULTIVARIATE ANALYSIS

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### ABSTRACT

This study investigated the association between women's empowerment and the utilization of maternal health services by women in Egypt and analyzed the dimensions of women's empowerment that are associated with increased health service utilization. A cross-sectional survey was conducted in a village in Egypt in November 2007. A total of 189 women, who had ever been married and had at least one child, were interviewed to collect data on the utilization of maternal health services, such as the number of antenatal care (ANC) visits during their pregnancies and whether delivery of their child was attended by skilled health personnel. Proxy variables on five different dimensions of women's empowerment were obtained by principal component analysis, and were tested for an association with the utilization of maternal health services, using logistic regression models. The five dimensions extracted from the data were freedom of movement, economic security and stability, support by family and freedom from domination, decision-making in daily life, and relationship with the community / participation in society. Among these dimensions, support by family and freedom from domination was the only factor that was positively associated with maternal health service utilization (regular ANC: OR=1.38,  $P=0.05$ ; deliveries assisted by skilled health personnel: OR=1.71,  $P=0.01$ ). Current age was also associated with the latter, possibly influenced by the recent rapid increase in the provision of health services in the village studied. Furthermore, this study revealed that a relatively high proportion of younger women still only limited access to maternal health services in Egypt.

Key Words: maternal health, health service utilization, women's empowerment, principal component analysis, Egypt

### INTRODUCTION

Improving women's access to maternal health services is important in reducing the health risks of mothers and newborns.<sup>1,2)</sup> However, the utilization of these services (demand side) would not often increase as expected, even though the physical and financial accessibility to the services

Received: July 16, 2013; accepted: February 11, 2014

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(supply side) is improved. Thus, it is also important that the users, or the women, are highly motivated and empowered to use the services.<sup>3, 4)</sup> In a study of Demographic and Health Surveys from 31 developing countries,<sup>3)</sup> women with at least primary education, implying that they are at a higher level of empowerment than women with no formal education, were likely to make frequent antenatal care (ANC) visits, as well as have a presence of a skilled attendant at birth. Therefore, in order to improve the health of women and their newborns, it is important not only to provide necessary health services, but also to empower women so that they can make the right decisions when seeking those services.<sup>4, 5)</sup>

In this article, we aimed to analyze the association between women's empowerment and their utilization of maternal health services in an Egyptian village. The term "empowerment" has been used to represent a wide range of concepts. We defined the term "women's empowerment" in this study as "women's sense of self-worth; their right to have and determine choices; their right to have access to opportunities and resources; and their right to have the power to control their own lives, both within and outside their home".

Because of its multidimensionality, it is usually not appropriate to use a single indicator to measure empowerment.<sup>6)</sup> Moreover, it is the dimensions of empowerment that give us useful information when analyzing association, and when setting targets for possible intervention programs used to improve health outcomes.<sup>6)</sup> Therefore this study further focused on different dimensions of women's empowerment, and aimed to identify the dimensions of empowerment that are associated with health service utilization.

## MATERIALS AND METHODS

An interview-based, cross-sectional study was conducted among adult women residing in a village of Giza Governorate, Egypt in November 2007.

### *Characteristics of the study site and the population*

The village was located 15 km from Cairo; and the population at the time of the study was approximately 20,000, as estimated from the latest census results and the annual population growth rate of the Governorate. Household structure was a mixture of traditional extended families and clusters of newly settled nuclear families, reflecting the rapid development and population expansion of greater Cairo. Agriculture, such as cultivating wheat, rice, and vegetables, was the primary industry in this village; however, a considerable proportion of villagers were also engaged in working in local factories or construction sites, and not a few residents were working in the city as employees. All villagers were moderate Sunni Muslims,<sup>7, 8)</sup> and women's lifestyle and behaviours were not restricted very much, unlike those in other fundamental or strict Islamic societies.

### *Access to health services in the village*

Physical access to medical and health services was generally good in the village studied, where medical care was provided by a public health center, as well as by several private clinics. An obstetrician worked at the health center, which had a maternal and child-health care facility, and provided pregnant women and new mothers with a series of ANC and postnatal check-ups, delivery, and immunization, as well as with health education sessions on family planning, nutrition, endemic diseases, etc.

### *Sampling of study participants*

Study subjects were women who had ever been married, were residing in the village, had at least one child, and were aged between 20 and 49 years at the time of the interview.

Neither a precise local population registry nor an accurate street map of the village was available: so initially, we divided the village into five wards of approximately similar areas, on a rough map of the village, according to natural and artificial boundaries such as wide streets or canals. Assuming that there was no great difference in population across the wards, around 40 households from each ward were arbitrarily selected, and one woman from each household, who met the inclusion criteria, and was available at the time of the visit of the interviewers, was selected as a study participant. The total number of women interviewed was 201; however, 12 were subsequently excluded from the study, as they did not respond to key questions necessary for the analysis. Therefore, 189 individuals were included in the present analysis.

### *Interview of study participants*

A face-to-face interview was carried out at the home of each participant by a pair of trained female Egyptian interviewers, using a structured questionnaire written in Arabic. The questionnaire was developed by referencing various survey questionnaires, for example, Demographic and Health Surveys that have been used in Egypt in the past.<sup>9, 10)</sup> The participants were asked whether they had utilized certain health services during their last pregnancy and at the time of delivery, such as ANC, or if skilled health personnel had attended at birth. Information on social status and empowerment of the participant was obtained using a set of relevant questions based around financial stability and the decision-making powers of the participant, and the level of support they received from other members of their household. Age, education, family structure, and other demographic information were also obtained as control variables.

### *Variables*

The principal hypothesis behind this study was that among the different dimensions of women's empowerment in Egypt, some are positively associated with an increased utilization of maternal health services. To test this hypothesis, we initially selected two dependent variables regarding the utilization of maternal health services, and identified five proxy variables representing the different dimensions of empowerment, aggregated from several indicator variables. Those indicators and their relevant questions are listed in Table 1.

**Dependent variables:** We set two dependent variables to indicate whether each participant had utilized maternal health services during her last pregnancy and delivery. The first variable was whether the participant had visited ANC at least four times during her last pregnancy, which has been regarded as "regular" attendance by the World Health Organization (WHO).<sup>11)</sup> The second variable was whether the delivery of her last child had been assisted by skilled health personnel; *i.e.*, midwives, doctors, or nurses, who had been formally educated and trained the skills needed to manage normal pregnancies and deliveries.

**Proxy indicator variables for dimensions of empowerment:** Five proxy indicators for different dimensions of women's empowerment were selected, using those employed in previous studies as a reference,<sup>12, 13)</sup> namely, freedom of movement, economic security and stability, support by family and freedom from domination, decision-making in daily life, and relationship with community and social participation. Each proxy variable was calculated from relevant questions in the questionnaire, using principal component analysis (PCA) to determine the weight of individual variables.<sup>14, 15)</sup> We adopted PCA to obtain unique proxy indicators for different dimensions of the empowerment, so that the association of those dimensions with the utilization of health services could be assessed in regression analysis. The first principal component of each PCA was chosen

**Table 1** Five dimensions of women's empowerment and their corresponding questions in the study questionnaire

Dimensions	Questions related to the dimension
Freedom of movement	Do you need to get permission from your family if you wish to go outside your home? Are you allowed to go alone to market / health center / outside the village / visit your friend's home?
Economic security and stability	Are you engaged in any activities (jobs) with cash income? What is the amount of money you can spend freely? How much money does your household earn in a month?
Support by family / Freedom from domination	Is physical support by your family available in household chores? Are you living with your mother-in-law / daughters-in-law? Have you ever been hit by your husband? Are you regularly hit by your husband?
Decision-making in daily life	Who makes a decision on what to cook? Who holds the final say in buying things for your family / for your child / for yourself? Who makes a decision on child's schooling / family planning?
Relationship with community / Participation in society	Are you aware of any community activities in your community? Do you participate in those activities? Do you have time to participate in the activity?

to represent each of the five proxy indicators, and used in the following regression models as continuous variables.

Control variables: Questions regarding other socioeconomic factors, such as current age, age at marriage, and level of education, were asked in the questionnaire. All variables, except current age and age at marriage which were continuous variables, were converted into dichotomous variables. These variables were entered into the following regression analysis as control variables.

#### *Data analysis*

All data were entered in Microsoft Excel 2003. STATA release 11.1 (Stata Corp., College, Texas, USA) was used to derive descriptive statistics, obtain proxy indicators for empowerment by PCA, and conduct the subsequent analysis. We performed logistic regressions to analyze the association between the utilization of health services by the participants, and the five dimensions of women's empowerment and other control variables. All proxy variables and those control variables that were significantly associated (Wald  $P < 0.05$ ) were retained in the regression models.

*Ethical Considerations*

Participants were informed of the objectives and the methods of this study, and a written consent to take part was obtained from each of these individuals.

Ethical clearances for this study were obtained from the Ethics Review Committee of Nagoya University School of Medicine, Nagoya, Japan (Approval Number 574, November, 2007), as well as from Cairo University Faculty of Nursing, Cairo, Egypt.

## RESULTS

*Empowerment of the study participants*

As shown in Table 2, 86 out of the 189 participants (46 %) answered that they had ever attended formal education, or at least primary school education. The proportion was higher in younger age group, reaching 79 % among women younger than 25 years old (table not shown). Thirty-nine participants (21 %) answered that they had a job for which they were paid in cash, and the majority of these women were selling crops and vegetables in the market. Seven women (4 %) answered that they owned their own stalls, financed by a governmental financial support program.

Eighty-seven percent of participants answered that they required asking their family for permission to go anywhere, yet the degree of restrictions on movement differed widely among age groups, and was related to their destinations of visit. In contrast with visiting the mosque, their child's school, or going outside of the village, there were fewer restrictions on going to health facilities, although over half of the women (58 %) answered that they were required to ask their husbands for permission when they wished to visit the health center.

There were several community-based activities in the village, such as literacy class for the illiterate, and sewing and other handicraft training sessions for women, as well as a nursery for pre-school children, which were run by a local non-governmental organization. The proportion of women who knew about these activities was only 34 %, and the proportion that had ever participated in any of these activities was 16 %. The main reasons for this lack of participation, even if the women were aware of the activities taking place, were "I don't need to participate" (35 %); and "I don't know how to participate" (31 %).

*Health service utilization by the study participants*

Table 3 summarizes the utilization of maternal health services, including regular ANC and deliveries assisted by skilled health personnel, by the participants. Both indicators of service utilization were generally high in younger age groups. However, it was revealed that 12 % of the participants who were aged between 20 and 29 years answered that they had not had ANC at all during their last pregnancy. The number of children each participant had given birth to ranged from 1 to 10, with the median being 3.

*Logistic regression analysis*

Tables 4 (a) and 4 (b) show the results of multivariate logistic regression analyses to investigate the dimensions of women's empowerment that were associated with health service utilization.

The factor that was most significantly associated with regular ANC was age; the younger the age of the women, the more she attended regular ANC (Table 4 (a)). Greater support by family members and freedom from domination were also associated with higher levels of regular ANC. Women who married young were likely to have less access to ANC.

Having a delivery assisted by skilled health personnel, the other indicator of the use of

**Table 2** Characteristics of the study participants

Variables		n	Valid %
Age	20–29	100	52.9
	30–39	56	29.6
	40–49	33	17.5
Age at first marriage	≤15	48	25.4
	16–17	69	36.5
	≥18	72	38.1
Level of education	no formal education	103	54.5
	≥primary school	86	45.5
Level of husbands' education	≤primary school	117	62.2
	>primary school	71	37.8
	no answer	1	-
Permission needed to go out	yes	157	87.2
	no	23	12.8
	no answer	9	-
Cash income	yes	39	21.1
	no	146	78.9
	no answer	4	-
Support in household chores	yes	66	35.5
	no	120	64.5
	no answer	3	-
Family structure	nuclear	93	49.2
	extended/joint	96	50.8
Husbands' physical assaults	yes	80	42.8
	no	107	57.2
	no answer	2	-
Decision-making on household issues*	score≤3	84	44.9
	score>3	103	55.1
	no answer	2	-
Decision-making on expenditure*	score≤5	84	44.7
	score>5	104	55.3
	no answer	1	-
Awareness of community activities	yes	65	34.4
	no	124	65.6
Participation in community activities	yes	30	15.9
	no	159	84.1
Total		189	100.0

\*Variables for participation in decision-making processes were transformed into scores, by aggregating answers of relevant sub-questions. In each sub-question, women who could make a decision alone were given a full score of two points, who could only decide partly were given one point, and who could not join the decision making process were given zero point.

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health services, showed similar results in terms of the association with dimensions of women's empowerment. Again, greater support by family was associated with high service utilization. Other dimensions, that is, community participation, freedom of movement, economic stability, and decision-making, did not show significant associations with the attendance of skilled health personnel at delivery.

**Table 3** Maternal health service utilization in the last pregnancy / delivery by study participants

Age (years)	n	Women who attended regular ANC (%)	Women whose delivery was attended by skilled health personnel (%)	Women who did <b>not</b> visit ANC at all (%)	Average number of children
20–29	100	68 (68 %)	93 (93 %)	12 (12 %)	2.1
30–39	56	19 (34 %)	40 (71 %)	20 (36 %)	4.0
40–49	33	4 (12 %)	18 (55 %)	23 (70 %)	4.9
Total	189	91 (48 %)	151 (80 %)	55 (29 %)	3.1

**Table 4** Dimensions of empowerment associated with the utilization of maternal health services: multivariate logistic regression models

(a) Regular ANC			
Independent variables	OR	(95 % CI)	<i>P</i>
Dimensions of women's empowerment			
Freedom of movement	0.77	(0.51 – 1.07)	0.1
Economic security and stability	1.14	(0.92 – 1.40)	0.2
Support by family / freedom from domination	1.38	(1.01 – 1.92)	0.05
Decision-making in daily life	0.93	(0.76 – 1.13)	0.5
Relationship with community / participation in society	1.17	(0.81 – 1.58)	0.4
Current age	0.89	(0.85 – 0.93)	<0.01
Age of marriage	1.25	(1.10 – 1.42)	<0.01

OR: odds ratio, controlling for all other variables in the table; CI: confidence interval

(b) Delivery assisted by skilled health personnel			
Independent variables	OR	(95 % CI)	<i>P</i>
Dimensions of women's empowerment			
Freedom of movement	1.10	(0.72 – 1.67)	0.7
Economic security and stability	1.23	(0.93 – 1.62)	0.1
Support by family / freedom from domination	1.71	(1.13 – 2.62)	0.01
Decision-making in daily life	0.98	(0.76 – 1.27)	0.9
Relationship with community / participation in society	1.08	(0.80 – 1.45)	0.6
Current age	0.88	(0.84 – 0.93)	<0.01

OR: odds ratio, controlling for all other variables in the table; CI: confidence interval

## DISCUSSION

### *Dimensions of empowerment associated with maternal health service utilization*

This study aimed to investigate the dimensions of women's empowerment which are associated with an increased utilization of maternal health services in a village in Egypt. We found that there was a significant association between the dimension "support by family and freedom from domination" and the utilization of maternal health services in the village studied. As shown in the method section and in Table 1, this proxy variable was derived from questions around availability of support from family members in doing chores, and experience of physical abuse by husbands, based on the Schuler's model.<sup>12)</sup>

Family support has been regarded as one of the factors that had an influence on ANC visits or the attendance of skilled health personnel at delivery. Studies conducted in South Asia and Islamic countries showed that support from natal kin,<sup>13)</sup> as well as from husbands or in-laws,<sup>16, 17)</sup> was associated with an increase in maternal health service utilization. Family support can encourage women to attend ANC, not only by providing the means of physical take-over of the household chores, but also through understanding and sympathy by using good communication among family members.<sup>18, 19)</sup>

Observations that women who have experienced physical abuse are less likely to initiate ANC have been reported from both the industrialized world<sup>20, 21)</sup> and poorer countries.<sup>22, 23)</sup> Domestic violence, directly or indirectly, increases the risk of illness and death of newborns,<sup>24-28)</sup> thus, appropriate pre- and postnatal care is required, especially for those women who experience physical abuse. In our questionnaire, we did not ask whether physical abuse had been experienced during pregnancy specifically, but the finding of a positive association between freedom from domination and the utilization of maternal health services suggests that efforts to reduce levels of domestic violence by different channels would reduce risks of negative reproductive health outcomes.<sup>23)</sup>

We did not find an association between the economic stability of the participants and maternal health service utilization, although it has frequently been observed that women with a cash income have improved access to health services during pregnancy and delivery.<sup>12, 29, 30)</sup> A possible explanation of our finding is that financial burden in consultation or treatment was not a major barrier to accessing of health services in Egypt, as the treatment cost of primary health service was relatively low and patients generally feel that these costs were reasonable.<sup>31)</sup>

Our observation that those of younger age showed greater use of maternal health services can be explained by the fact that younger women have improved access to information and education,<sup>9, 32)</sup> and hence greater awareness of their health compared to older women. This improved awareness of women was brought by the remarkable social and economic development in Egypt between early 1990s and mid 2000s,<sup>33-36)</sup> when the women experienced their last pregnancies and deliveries. Between 1990 and 2007, gross national income per capita increased from US\$ 750 to US\$ 1,630, and life expectancy at birth improved from 65 years to 70 years.<sup>37)</sup> In addition, the provision of health services has been rapidly improved in Egypt over the recent decades<sup>32, 38)</sup> through the health sector reform programs of the Egyptian government.<sup>35, 39)</sup> However, it is noteworthy that as many as 12 % of younger women in our study did not visit ANC during their last pregnancies. Further study is required to investigate the factors that hindered those women from using the recommended health services.

### *Measuring different aspects of empowerment*

In an attempt to examine the impact of women's empowerment on maternal health service utilization, we categorized individual questions in the questionnaire into five unique dimensions of empowerment and compared the association of each dimension with health service utilization



in this study. This procedure of measuring many components of empowerment was important, because more than two dimensions are likely to be associated with outcome indicators at the same time, as well interact with each other.<sup>6, 32)</sup> We initially set five key dimensions of empowerment, based on a study conducted in Bangladesh by Schuler and Hashemi,<sup>12)</sup> and allocated each variable in the questionnaire to the most appropriate dimensions. Unlike Schuler and Hashemi, who arbitrarily gave scores for each question and simply added these to obtain the overall score, we adopted PCA to reduce the subjectivity of weighing each score. PCA is a mathematical technique that transforms correlated variables into a small number of uncorrelated variables called principal components.<sup>15)</sup> This method reduces the number of correlated variables, minimizing the loss of information, so one of its most useful applications is to create a proxy indicator for grouped information. A technique analogous to PCA is factor analysis, and several studies have adopted this technique to identify proxy indicators of women's empowerment to investigate their association with the outcome of child health.<sup>6)</sup>

This study has several limitations. First, there might be recall bias in the responses, as the women were asked about their past pregnancies and deliveries. Second, the analyses were based on self-reported responses, which might not be exactly same as their actual health seeking behaviours. Third, the study was conducted in a village in Egypt, thus the findings may or may not be applicable to any other parts of Egypt and other developing countries.

In conclusion, to improve maternal health outcomes, it is important to motivate women to utilize the available services. We found that, in a village in Giza Governorate, support by family and freedom from domination was positively associated with maternal health service utilization. It is not yet clear to what extent women's empowerment contributes to their health status; however, the findings could be the first step towards increasing service utilization, especially for women whose access to health services is inadequate. Our study has also indicated that women should not be the only targets. Encouraging families, as well as the local community, to support women could be equally important and effective in improving their utilization of health services, as support from others was found to be associated with an increase in service utilization by women.

## ACKNOWLEDGMENTS

We would like to extend our gratitude to the participants of the study. Their cooperation was valuable, and was greatly appreciated.

This study was in part supported by Grant-in-Aid for Scientific Research (B, 19406024) to AA from Japan Society for the Promotion of Science, and in part by the International Cooperation Research Grant (17-3) to AA from the Ministry of Health, Labour and Welfare, Japan.

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