Original article

Predicting Maternal Health Care Use by Age at Marriage in Multiple Countries

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A B S T R A C T

Purpose: In light of the global pervasiveness of child marriage and given that improving maternal health care use is an effective strategy in reducing maternal and child morbidity and mortality, the available empirical evidence on the association of child marriage with maternal health care utilization seems woefully inadequate. Furthermore, existing studies have not considered the interaction of type of place of residence and parity with child marriage, which can give added insight to program managers.
Methods: Demographic Health Survey data for seven countries are used to estimate logistic regression models including interactions of age at marriage with area of residence and birth order. Adjusted predicted probabilities at representative values and marginal effects are computed for each outcome.
Results: The results show a negative association between child marriage and maternal health care use in most study countries, and this association is more negative in rural areas and with higher orders of parity. However, the association between age at marriage and maternal health care use is not straightforward but depends on parity and area of residence and varies across countries. The marginal effects in use of delivery care services between women married at age 14 years or younger and those married at age 18 years or older are more than 10% and highly significant in Bangladesh, Burkina Faso, and Nepal.
Conclusions: The study's findings call for the formulation of country—and age at marriage—specific recommendations to improve maternal and child health outcomes.

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IMPLICATIONS AND CONTRIBUTION

This study provides evidence of different patterns of interaction between child marriage and area of residence and birth order in maternal health care use in seven countries. Results indicate that country-specific strategies would be most effective in improving maternal health care use.

Despite a decline in the global prevalence of child marriage, its pervasiveness accounts for one child bride in every four young women [1]. The decline in child marriage prevalence is uneven across regions with encouraging trends seen between 1985 and 2010 in Middle East and North Africa, from 34% to 18% among women married before 18 years in the 20-24 year age group, and in South Asia from 32% to 17% among women married before 15 years in the 20-24 year age group, whereas a negligible change is observed in Latin America and the Caribbean where child marriage prevalence remains at around 30% [1]. Even with a continuing pace of decline, concurrent population growth will result in the total number of child brides globally to remain around 700 million by 2050 [1]. Owing to the adverse health

consequences of child marriage [2,3], this substantial number will also have an impact on the global maternal and child health outcomes. This is corroborated by the observation that countries with a high prevalence of child marriage also show high maternal and infant mortality and low rates of maternal health care use [4,5].

Poor health outcomes among child brides are related not only to early sexual debut and pregnancy [6–8] but also to the vulnerable context of child marriage itself [9]. The latter has been linked to less education, mobility, media exposure, and limited social networks among married as compared with unmarried girls, and less household and economic power [9]. This vulnerability is evident in poor fertility control and maternal health care use resulting in pregnancies being "too soon, too late, too many and too close together" [10]. Godha et al. [6] found poor maternal health care utilization among child brides in four South Asian countries using Demographic and Health Survey (DHS) data. Receipt of four or more antenatal visits was estimated to be 14.5% lower among Bangladeshi women married at age 14 years or younger, whereas skilled attendance at birth was found to be 0.55 times lower among Pakistani women married at age 15–17 years, and the odds of institutional delivery were significantly lower among Indian and Bangladeshi women married at age 14 years or younger as compared with their counterparts married at age 18 years or older [6]. Similarly Santhya et al. [11] concluded that young women married at age 18 years or older were more likely to undergo institutional delivery than those married at younger ages. In another study using India DHS 2005–2006, Raj found that the likelihood of obtaining antenatal care (ANC) showed a gradient decline with decreasing age at marriage [12]. In light of the global pervasiveness of child marriage, the available empirical evidence associating child marriage with maternal health care use in a few South Asian countries seems woefully inadequate.

Furthermore, rural residence and high parity (multiple births) have been found to be associated with both child marriage [1,13] and poor maternal health care use outcomes [14–16]. A systematic review of maternal health care use in developing countries found evidence that urban women were more likely to have skilled attendance at birth and institutional delivery as compared with rural women although evidence on the association between early ANC and residence was inconsistent [16]. Another systematic review on the determinants of use of delivery care services found it to be higher among women delivering for the first time and for lower order births as compared with higher order births [15]. Similarly, the economic and sociocultural context of maternal health care use or child marriage practices cannot be ignored [16–18]. Sociocultural and family influences are believed to be greater in rural areas as compared with urban areas [19]. Although the child marriage studies conducted so far have controlled for area of residence and parity, none have considered how these factors interact with child marriage to influence maternal health care utilization.

The purpose of the study was to explore the association of child marriage with maternal health care utilization, after controlling for background characteristics, and to investigate how this association varies by rural–urban residence and birth order. The study includes low- and middle-income countries from different regions of the world to understand this association in different contexts and presents the results in easily comprehensible graphs to provide better insight to policymakers and program managers. We hypothesize that child marriage is negatively associated with maternal health care use and that this association varies by age at marriage, residence and parity, being more negative for lower age at marriage, rural residence, and higher parity.

Methods

The study utilizes data from the DHS in seven countries. Original work for this study was carried out for a larger United Nations Children's Fund (UNICEF)-funded study where country selection was based on two inclusion criteria: (1) availability of recent data from DHS or Multiple Indicator Cluster Surveys conducted in 2005 or later and (2) availability of at least three data points (with the exception of Serbia). Twelve countries were purposively selected for geographical representation and representation across the child marriage prevalence spectrum [20]: (1) Serbia and Vietnam (prevalence of 10% or less); (2) Egypt and Peru (prevalence of 11%–24%); (3) Burkina Faso, Ethiopia, and Dominican Republic (prevalence of 25%–49%); and (4) Bangladesh, Nepal, Mali, Mozambique, and Niger (prevalence of 50% or more). Of these, analysis is restricted to seven countries with prevalence levels greater than 24%. Dominican Republic was dropped from the analysis because maternal health care utilization is nearly universal (>97%). Ethical approval for the survey protocol and tools was granted by the ICF Institutional Review Board, United States of America [21]. Analyses are restricted to women aged 20–24 years who were currently married or living together at the time of the survey and to their most recent birth in the 5 years preceding the survey to minimize period effects, and to those with no missing data on any of the variables included in the analysis.

This study explores the association of child marriage with three maternal health care utilization outcomes defined by World Health Organization: (1) four or more ANC visits; (2) skilled attendance at birth; and (3) institutional delivery. Child marriage, defined as whether a woman was first married or in union before the age of 18 years, is further categorized into two groups: (1) first marriage at age 15–17 years and (2) first marriage at age 14 years or younger. Birth order has been truncated at four to indicate four or more births. In addition, the multivariate models control for background characteristics including the respondent's age in years, education, and religion; household wealth terciles; and spouses' relative education and age.

Descriptive analyses include distribution of participants by background characteristics and maternal health care service uptake in the study populations. For multivariate analyses, logistic regression models including interactions of age at marriage with area of residence and birth order are estimated, after controlling for other background characteristics. Subsequently, adjusted predicted probabilities at representative values and marginal effects are computed for each outcome. The former is computed by averaging the predicted probabilities for each case, keeping area of residence and birth order fixed and the actual observed values for remaining variables. The marginal effects show the change in adjusted predicted probability of maternal health care use between women married at age 15–17 years and women married at age 14 years or younger as compared with those married at age 18 years or older. Results are presented as graphs of adjusted predictive probabilities. A downward slope indicates a negative association between the