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CHILD MARRIAGE AND ITS IMPACT ON MATERNAL AND CHILD HEALTH IN PAKISTAN

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DECLARATION

This dissertation is the result of an independent investigation. Wherever the work is indebted to the work of others it has been acknowledged and cited. I declare that this dissertation has not been accepted in substance for any other degree, nor is it concurrently being submitted in candidature or achievement of any other degree at any other university.

Muazzam Nasrullah

Bielefeld, January 2015

DEDICATION

This dissertation is dedicated to my parents whose prayers, sacrifice and efforts made me what I am today and whatever I will accomplish in future.

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LIST OF PUBLICATIONS

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I. Nasrullah M, Zakar R, Krämer A. **Effect of Child Marriage on Use of Maternal Health Care Services in Pakistan.** *Obstet Gynecol.* 2013; 122(3):517-24. ***Impact Factor: 5.175 (2014)***

II. Nasrullah M, Muazzam S, Bhutta ZA, Raj A. **Girl Child Marriage and Its Effect on Fertility in Pakistan: Findings from Pakistan Demographic and Health Survey, 2006-2007.** *Matern Child Health J.* 2014; 18(3):534-43. ***Impact Factor: 2.083 (2014)***

III. Nasrullah M, Zakar R, Zakar MZ, Krämer A. **Girl Child Marriage and Its Association With Morbidity and Mortality of Children Under 5 years of Age in a Nationally Representative Sample of Pakistan.** *J Pediatr.* 2014; 164(3):639-46. ***Impact Factor: 3.790 (2014)***

IV. Nasrullah M, Zakar R, Zakar MZ. **Child Marriage and Its Associations With Controlling Behaviors and Spousal Violence Against Adolescent and Young Women in Pakistan.** *J Adolesc Health.* 2014; 55(6):804-09. ***Impact Factor: 3.612 (2014)***

V. Nasrullah M, Zakar R, Zakar MZ, Abbas S, Safdar R, Shaukat M, Krämer A. **Knowledge and Attitude Towards Child Marriage Practice Among Women Married as Children — A Qualitative Study in Urban Slums of Lahore, Pakistan.** *BMC Public Health.* 2014; 14:1148. ***Impact Factor: 2.260 (2014)***

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
AOR	Adjusted Odds Ratio
ARI	Acute Respiratory Infection
CB	Controlling Behaviors
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CI	Confidence Interval
CRC	Convention on the Rights of the Child
FANA	Federally Administrative Northern Areas
FATA	Federally Administrative Tribal Areas
HIV	Human Immunodeficiency Virus
ICCPR	International Convention on Civil and Political Rights
ICRW	International Council for Research on Women
IRB	Institutional Review Board
MDG	Millennium Development Goals
MFLO	Muslim Family Laws Ordinance
MMR	Maternal Mortality Rate
NGO	Non-governmental Organization
NIPS	National Institute of Population Studies
NWFP	North West Frontier Province
OR	Odds Ratio
PDHS	Pakistan Demographic and Health Survey
SD	Standard Deviation
UNICEF	United Nations Children's Fund
WHO	World Health Organization

ABSTRACT

Background

Child marriage, defined as marriage prior to 18 years of age is expected to become the reality of 100 million adolescent girls in the developing world during the next 10 years. Sub-Saharan Africa and South Asia regions have one of the highest rates of child marriages in the world. The practice is prevalent in Pakistan, which disproportionately affects young girls in rural, low income and low education households. Our study objectives were: To determine the association between child marriage and maternal healthcare services utilization in Pakistan beyond those attributed to social vulnerabilities (women's economic status, education, ethnicity, and place of residence) (Paper I). To determine the association between child marriage and high fertility and poor fertility health indicators beyond those attributed to social vulnerabilities (Paper II). To determine the association between child marriage and morbidity and mortality of children under 5 years of age in Pakistan beyond those attributed to social vulnerabilities (Paper III). To determine the association between child marriage and controlling behaviors and spousal violence by husbands against adolescent and young women in Pakistan beyond those attributed to social vulnerabilities (Paper IV). To describe women's knowledge and attitude towards child marriage practice who themselves were married as children to gain insight, especially cultural factors for designing future interventions (Paper V).

Methods

Nationally representative cross-sectional data from Pakistan Demographic and Health Survey (PDHS), 2006-07 was used for papers I, II and III, and PDHS, 2012-13 for paper IV. In paper I, we limited the data to ever-married women aged 15–24 years with at least one childbirth (n=1,404) to identify differences in prenatal care provision (skilled or unskilled medical care provider), antenatal care (antenatal visits; care at home or hospital), care at delivery (assistance by unskilled medical care provider), and place of birth by early (younger than 18 years) compared with adult (18 years or older) age at marriage. In paper II, we limited the data to ever-married women aged 20-24 years (n=1,560) to identify differences in poor fertility outcomes [high fertility (three or more childbirths); rapid repeat childbirth (<24 months between births); unwanted pregnancy (any ever); pregnancy termination (any stillbirth, miscarriage or abortion ever)] by early compared with adult age at marriage. In paper III, we limited the data to children from the past five years, reported by ever- married women aged 15-24 years (n=2630 births of n= 2138 mothers) to identify differences in infectious diseases in past 2 weeks (diarrhea, acute respiratory infection [ARI], ARI with fever), children under 5 years of age mortality and infant mortality, and low birth weight by early compared with adult age at marriage. In paper IV, we limited the data to currently married women aged 15-24 years who had participated in the domestic violence module (n=589) to identify differences in controlling behaviors and spousal violence experiences between early and adult age at marriage. Associations between child marriage and health outcomes were assessed by calculating adjusted odds ratio (AOR) using logistic regression models after controlling for covariates including social equity indicators (education, wealth index, rural residence). In paper V, women of reproductive age (15-49 years) who were married prior to 18 years, for at least 5 years and had at least one childbirth were recruited from most populous slum areas of Lahore, Pakistan. Themes for the interview were developed using published literature and everyday observations of the researchers. Interviews were conducted by trained interviewers in Urdu language and were translated into English. The interviews were tape-recorded, transcribed, analyzed and categorized into themes.

Results

Paper I: Overall, 66.1% of ever-married women aged 15–24 years in Pakistan with at least one childbirth were married before the age of 18 years. More than half (61.9%) of women married as children had no formal education, and the majority (71.0%) resided in rural areas. Child marriage was significantly associated with decreased likelihood of any prenatal care (AOR=0.73; 95% CI: 0.534-0.993) and prenatal care by skilled medical care providers (AOR=0.64; 95% CI: 0.476-0.871), and increased likelihood of delivery assistance by unskilled medical providers (AOR=1.90; 95% CI: 1.435-2.518) and

delivery at home (AOR=2.17; 95% CI: 1.617-2.915). Paper II: Overall, 50% of ever-married women aged 20-24 years in Pakistan were married before the age of 18 years. Child marriage was significantly ($p<0.001$) associated with low social equity indicators (poverty, rural residence, and no formal education). Adjusted logistic regression models showed that girl child marriage was significantly associated with high fertility (AOR=6.62; 95% CI: 3.527-12.429), rapid repeat childbirth (AOR: 2.88; 95% CI: 1.832-4.543), unwanted pregnancy (AOR=2.90; 95% CI: 1.755-4.794), and pregnancy termination (AOR=1.75; 95% CI: 1.097-2.783). Paper III: Majority (74.5%) of births were from mothers aged <18 years. Marriage before 18 years increased the likelihood of recent diarrhea among children born to young mothers (AOR=1.59; 95% CI: 1.18-2.14). Even though maternal child marriage was associated with children under 5 years of age mortality and infant mortality in unadjusted models, associations were lost in the adjusted models. We did not find a relation between child marriage and low birth weight infants, and ARI. Paper IV: About one-third of women aged 15–24 years in Pakistan reported experiencing controlling behaviors (31.8%) and spousal violence (31.3%) by their husbands. Compared to adult marriage, child marriage was significantly associated with controlling behaviors (AOR=1.50; 95% CI: 1.042–2.157), emotional violence (AOR=1.86; 95% CI: 1.254–2.767), and physical violence (AOR=2.44; 95% CI: 1.582–3.760). Paper V: Nineteen of 20 participants who agreed to participate were married between 11-17 years. Most respondents were uneducated, poor and were working as housemaids. The majority participants were unaware of the negative health outcomes of child marriages. They appeared satisfied by the decision of their parents of marrying them before 18 years, and even condemned banning child marriages in Pakistan. Strong influence of culture and community perceptions, varying interpretation of religion, and protecting family honor are some of the reasons that were narrated by the participants, which seems playing a role in continuation of child marriage practice in Pakistan.

Conclusions

Interventions such as implementation and enforcement of strict laws prohibiting the practice, empowering women by increasing education, promoting civil, sexual and reproductive health rights, creating job opportunities, and enhancing women role in family decision-making can help in tackling child marriage practice in Pakistan. Significant efforts are needed locally and at governmental level to abolish the traditional cultural practices, which can directly reduce the high numbers of child marriages in Pakistan. Efforts to increase the age of marriage and delayed childbearing may have population level effect in reducing disparities between women married as children and adults, and improving maternal and child health in Pakistan.

BACKGROUND

CHILD MARRIAGE

Definition and Prevalence of Child Marriage Practice

Child marriage, defined as marriage prior to 18 years of age [1, 2] is expected to become the reality of 100 million adolescent girls in the developing world during the next 10 years [3]. Sub-Saharan Africa and South Asia regions have one of the highest rates of child marriages in the world [1, 4]. However, in the Middle East, North Africa and others parts of Asia child marriage practice is only prevalent among traditional families [4]. There are some specific areas in West and East Africa and South Asia where girls are married even before puberty, while parts of Latin America and few areas in Eastern Europe exhibit child marriage practice where girls are married between the ages 16-18 years [4]. These figures are under reported as in various parts of the world, unofficial or unregistered marriages are common that are not counted towards the official statistics of child marriage. According to the United Nations Children's Fund (UNICEF) report in 2005, 48 percent or 9.7 million women aged 15-24 years in Asia, 42 percent in Africa, and 29 percent in Latin America and the Caribbean were married before the age of 18 years [1]. Child marriage is also prevalent in the Middle East, where half of girls in Yemen and Palestine are married prior to the age of 18 years [2].

International Laws Against Child Marriages and United Nations Millennium Development Goals

Child marriage is a clear violation of international laws that includes *Universal Declaration of Human Rights 1948, International Convention on Civil and Political Rights 1966 (ICCPR), Convention on the Elimination of All Forms of Discrimination Against Women 1979 (CEDAW),* and *Convention on the Rights of the Child 1989 (CRC)* [5]. Universal Declaration of Human Rights 1948 says in Article 7 “All are equal before the law and are entitled without any discrimination to equal protection of the law” [5]. Child marriages where young girls do not enjoy equal human rights like men, and where consent cannot be made “free and full” for choosing a life partner because of immaturity of one of the parties is a clear violation of the law. CEDAW states in Article 16 (2) “The betrothal and the marriage of a child shall have no legal effect, and all necessary action, including legislation, shall be taken to specify a minimum age for marriage” [5]. CRC prohibits traditional practices that are harmful to the health of children (Article 24 (3)), and forbids States to not give validity to marriages that have not attained majority (Article 16 (2)) [5]. CRC defines child as “a child means every human being below the age of 18 years unless, under the law applicable to the child, majority is attained earlier." [5] Further, CRC considers 18 years as the minimum age for marriage for both man and woman [5].

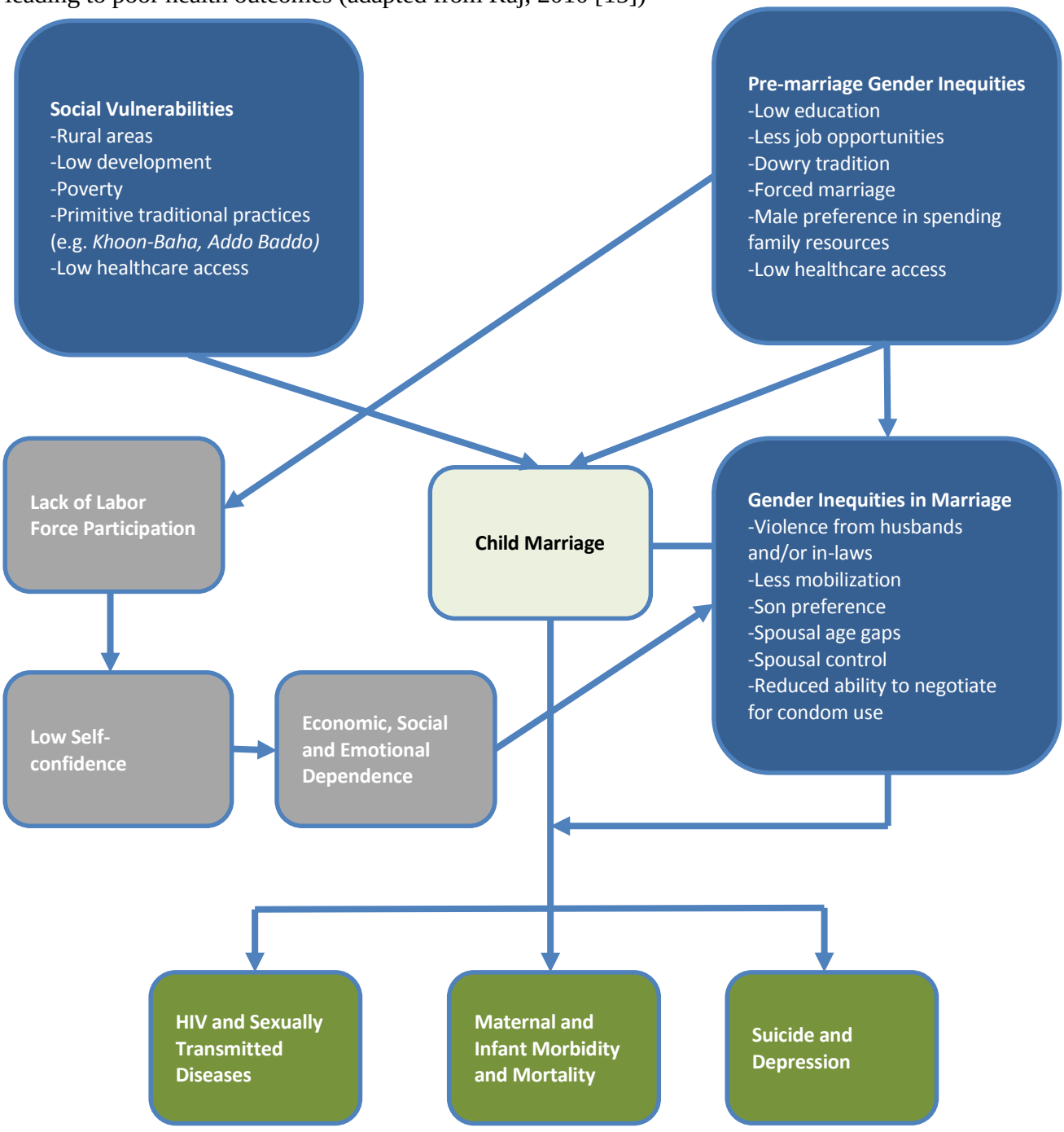
Child marriage practice hinders achieving the United Nations Millennium Development Goals (MDG) in promoting gender equality and women’s empowerment (MDG 3), reducing child mortality (MDG 4), and improving maternal health (MDG 5), especially in South Asia [6]. The United Nations MDG report 2011 clearly indicated the meager progress in achieving MDG 3, 4 and 5 in South Asia [6], and has prioritized these goals which underscore the need of reducing child marriage and its effect on maternal and child health.

Social Vulnerabilities and Health Impact of Child Marriages

Studies from other low- and middle-income countries have shown that women married as children are socially and economically disadvantaged [1, 2, 7]. Child marriage practice is common in poor countries and regions of the world, and even within these countries, the practice is concentrated in poor families [7]. Similarly, most girls who are victims of child marriage practice are either uneducated or dropped out of school very early [8, 9], as a result significant numbers of these girls are unable to earn their living and become socially and economically dependent on their in-laws or husbands. Husbands of these young girls are usually much older in age, and this large age gap is thought to contribute to the abusive power dynamics between the couple [1, 10].

Women married as children are found to be associated with maternal and child mortality and morbidity, including pregnancy complications [11-15]. In addition, child marriage is found associated with grand multiparity [16], and premature and low-birth weight infants [17]. The women married as children are also appear to be at forefront for domestic violence from their husbands and their in-laws [15, 18]. Being concentrated in rural and poor areas, the access to healthcare and trained health staff to majority of women married as children are rudimentary as a result many a times these women opted to deliver their babies at home and ended up in medical complications such as postpartum hemorrhage, premature labor and obstructed labor [2, 19-24]. Social and gender vulnerabilities to women married as children leading to poor health outcomes are shown in Figure 1.

Figure 1: Graphical representation of social and gender vulnerabilities to women married as children leading to poor health outcomes (adapted from Raj, 2010 [15])



SITUATION IN PAKISTAN

Gender Inequality and Low Female Empowerment

Pakistan is 100th out of 102 countries in terms of gender empowerment by the United Nations Development Program, depicting the heightened gender inequality and low female empowerment in the country [25]. There is a wide gap between males and females in terms of employment opportunities, paid work, access to health services and health outcomes in Pakistan [26]. The gender inequality has deep roots in Pakistani society. Culturally, in Pakistan, women are at disadvantage from birth and are predisposed to discrimination on the basis of their sex [27, 28]. Male gender is preferred over females as males are often perceived as an economic and social utility in families because of breadwinner of the house [27]. This can be further assessed by an imbalance in the sex ratio (91 women for every 100 men) in Pakistan when compared with industrialized countries [26]. Female infants are provided less care with fewer family resources as compared to their males counterparts [26]. Medical care for children is sought more frequently than for females at home, and even so more for sons than for daughters [29]. Similarly, critically ill male children were treated at hospitals twice as more likely than girls resulting in high mortality among females in Pakistan [30]. The neglect of girls continues in their later childhood and adolescence with only 25% of women able to complete their primary education as compared to 49% of men in Pakistan [26]. Females are often considered economic liability to a family because of dowry tradition in the country [31]. The dowry tradition that is largely practiced in Pakistan, consists of exchange of wealth, either in the form of money or gifts, before and after the marriage among bride's and groom's family, and is often misused by the husband and his family; the older the girl, the higher the likelihood of dowry demand [10, 31]. As a results of which, women are likely to get married at much younger ages [32], and become economically and socially dependent on family support. These factors clearly compromise the productivity of women by limiting their role in family decision-making even in matters related to their well-being [33].

Puberty, Marriage, and Childbearing

The mean age of puberty for females is 13.5 years and for males is 15.0 years in Pakistan [34]. The mean age of marriage among women in Pakistan has significantly increased from 13.3 years during 1950-59 to 23.1 years during 2006-07 with steady gains over time (16.8 years during 1960-69; 17.8 years during 1970-79; 18.6 years during 1980-89; 21.7 years during 1990-91) [35, 36], but the overall age at marriage is still much lower as compared to industrialized countries [4]. Women residing in rural areas tend to marry much earlier than those living in urban areas [34]. According to UNICEF estimate, the prevalence of child marriage among all women aged 20-24 years in Pakistan is 24.0% [37]. The practice disproportionately affects girls of lower socio-economic status and those residing in rural regions [34, 38]. Despite steady increase in age of marriage overtime in Pakistan, the national data show close relationship of marriage and childbearing [34]. It has been shown that marriages are almost immediately followed with a pregnancy among females younger than 20 years [34]. Overall, 42% of women got pregnant prior to the age of 20 years during 2001-02 in Pakistan [34]. Further, among ever-married women aged 20-24 years, 89% had at least one pregnancy and 24.5% had at least one childbirth during 2001-02 [34].

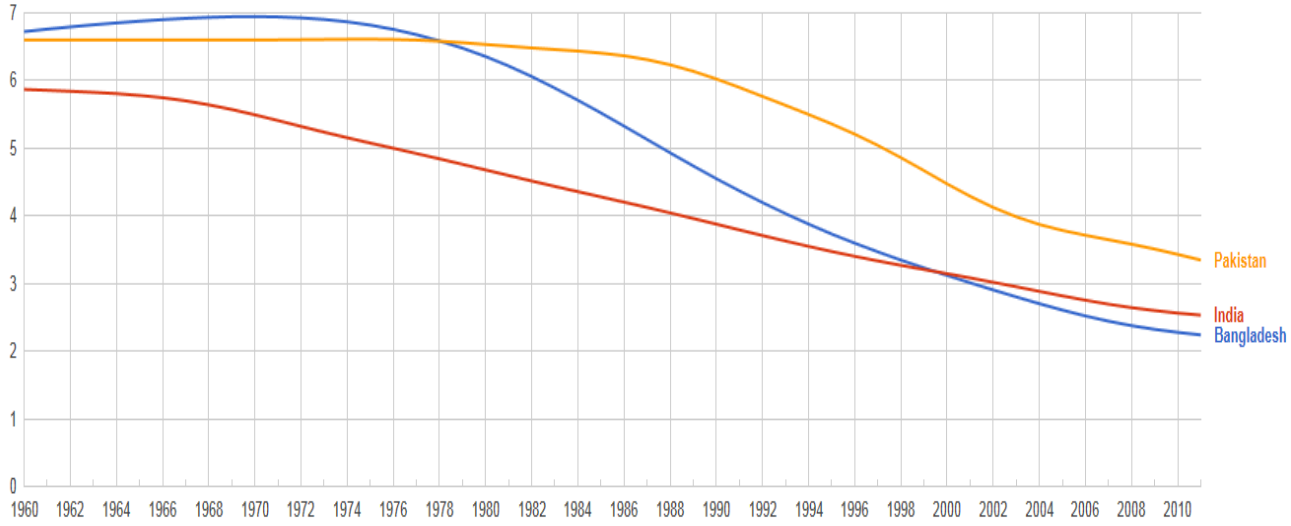
Fertility, Contraception, and Son Preference

The fertility rate in Pakistan has significantly decreased from 6.6 children born per women in 1960 to 3.35 in 2011, but the overall fertility rate is still much higher than some of the neighboring countries like India and Bangladesh (Figure 2). By 2020, the population policy of Pakistan has a target of achieving stabilization in population by annual reduction in population growth rate from 1.9% to 1.3% and total fertility rate at 2.1 [39]. However, there is only meager progress in achieving this goal with overall contraceptive rate still around 27% that is quite low as compared to other neighboring countries [40]. Several reasons that limit the use of contraception include women's perception of social unacceptability of contraception use, and conflict with their husbands' fertility preferences [41]. The prevalence is even worst among adolescent women in Pakistan because culturally it is expected of women to prove fertility

soon after the marriage. The prevalence of ever used contraception was only 7% among ever-married women aged 15-19 years and 20% among women aged 20-24 years during 2001-2002 [34].

Husbands desire of more children and son preference among couples in Pakistan have been attributed to high fertility and low contraception use among women [24, 42, 43] but whether these phenomena influence younger mothers more than adults is not known. Early pregnancy and childbirth predisposes these young girls to high maternal mortality, and perinatal and infant mortality, which when coupled with limited healthcare access and low antenatal services [34] lead to poor health outcomes.

Figure 2: Comparison of fertility rates (children born per woman) between Pakistan and its neighboring countries (India, Bangladesh) [44].



Maternal Mortality and Maternal Healthcare Services

In Pakistan, like other low-income countries, despite advances in medical technology, around 30,000 women die each year because of obstetric complications, which means one woman die every twenty minutes [25]. The Planning Commission estimated Maternal Mortality Rate (MMR) in Pakistan between 350 in 2000–2001 and 400 per 100 000 live births in 2005 with rates relatively higher in rural areas than in urban areas [25]. MMR is estimated to be 319 per 100 000 live births in rural areas, and 175 per 100 000 live births in urban areas of Pakistan [25]. Direct causes such as postpartum hemorrhage is one of the major reasons for maternal deaths followed by puerperal sepsis, eclampsia and obstructed labor in Pakistan [25, 45]. Only 13% of total maternal deaths are caused by indirect causes primarily due to complications of infectious diseases like cancer or hepatitis [25]. Maternal deaths are also directly related to the age of women. Girls between the ages of 10-14 years are five times more likely to die in pregnancy and child birth than women ages 20-24 years [2]. The MMR per 100,000 live births is unacceptably high in the country with most women below the age of 20 and above 40 die of pregnancy-related complications [25]. Delayed medical care during obstetric complications is the cause of most maternal deaths and broadly speaking can be divided into three types of delays [25]. First kind of delays occurs due to household constraints such as tradition of having home medical care and deliveries leading to delayed decision of seeking medical care. Second kind of delays occurs during transporting of women to hospitals due to lack of communication and quality ambulance services. The third type of delays occurs due to insufficient trained hospital staff, and non-availability of hospital supplies and equipment. The above-mentioned maternal causes of deaths are mostly preventable by medical monitoring, clean delivery, prompt administration of drugs, and provision of medical services [25, 46].

Morbidity and Mortality of Children Under 5 years of Age

Pakistan, one of the densely populated countries in Southern Asia has the 2nd highest under 5, infant and neonatal mortality rate in the Asia region after India [46-48]. Pneumonia and diarrhea, the highest killers

among children under 5 years of age in the country [49] are preventable by low-cost curative interventions [49], however insufficiently administered in Pakistan. Reports from UNICEF [49, 50] have shown that poverty including poor home environments and malnutrition significantly increase the risk of such infections among children thus increasing the likelihood of their mortality. In addition to malnutrition and unhealthy living conditions, poverty may also create conditions which increase gender disparity, discrimination against female children, and denial of free choice of marriage and reproductive autonomy. Women married as children were found to be associated with increased likelihood of low birth weight infants, and child and infant morbidity and mortality in studies from other countries [1, 2, 51]. Whether these associations hold true in Pakistan is unknown.

Spousal Violence

Spousal violence is a problem of public health concern in Pakistan [30, 31, 52, 53]. It is estimated that around 40% of ever-married women aged 15–49 years have suffered some form of violence in Pakistan during their lifetime, and every third woman in Pakistan has suffered physical violence [7]. Husbands are reported to be the culprits in 79% of cases of violence against ever-married women, indicating a high level of spousal violence in the country [7]. Low educational status, low levels of empowerment, poverty, and misuse of the dowry system were found to be some of the factors associated with spousal violence in Pakistan [31]. The extent to which adolescent and young women who were married as children experience spousal violence and controlling behaviors (CB) by their husbands is unknown in Pakistan.

SIGNIFICANCE OF THE STUDY

Child marriage practice affects boys and girls but the practice disproportionately affects girls, and the negative health outcomes among girls are far more than boys. The thesis is only focused on girls that are affected by child marriage practice in Pakistan. The prevalence of child marriages, even though less than some of the neighboring countries like India, Nepal and Bangladesh is still substantial in Pakistan. Studies from other low-income countries have shown that child marriages are associated with high maternal and child mortality and morbidity [11-15]. Further, reports from UNICEF and International Council for Research on Women (ICRW) consisting of data from countries of South Asia, Africa and Latin America and the Caribbean found that women married as children compared to those married as adults are mostly poor, uneducated, reside in rural areas, and have low access to healthcare services [1, 2]. This disproportionate risk of high maternal and child mortality and morbidity seems to be related to socio-economic, cultural and structural vulnerabilities such as increased poverty, lack of access to quality health care, and restricted mobility in rural areas. Such vulnerabilities are further aggravated due to under-developed health related infrastructure, limited decision-making power of women within the household, and their restricted access to resources [8, 50, 54]. It is therefore, critical to understand the impact of child marriages on morbidity and mortality of women and children beyond those attributed to social vulnerabilities to clarify whether these poor health outcomes are consequences of early marriages or increased social and structural vulnerabilities of these young mothers make them and their children highly susceptible to health risks. Further, the quantitative data in the thesis is complimented by first ever collected qualitative in-depth interviews with women who themselves were married as children to understand women's knowledge and attitude towards child marriage practice in Pakistan. This information is useful for designing future interventions to prevent child marriages in the country.

AIMS AND OBJECTIVES OF THE THESIS

The aim of the thesis is to determine the association between child marriage and maternal and child health outcomes among married women in Pakistan.

The specific objectives of the thesis are:

1) To determine the association between child marriage and maternal healthcare services utilization in Pakistan beyond those attributed to social vulnerabilities (women's economic status, education, ethnicity, and place of residence).

2) To determine the association between child marriage and high fertility and poor fertility health indicators beyond those attributed to social vulnerabilities (women's economic status, education, ethnicity, and place of residence).

3) To determine the association between child marriage and morbidity and mortality of children under 5 years of age in Pakistan beyond those attributed to social vulnerabilities (women's economic status, education, ethnicity, and place of residence).

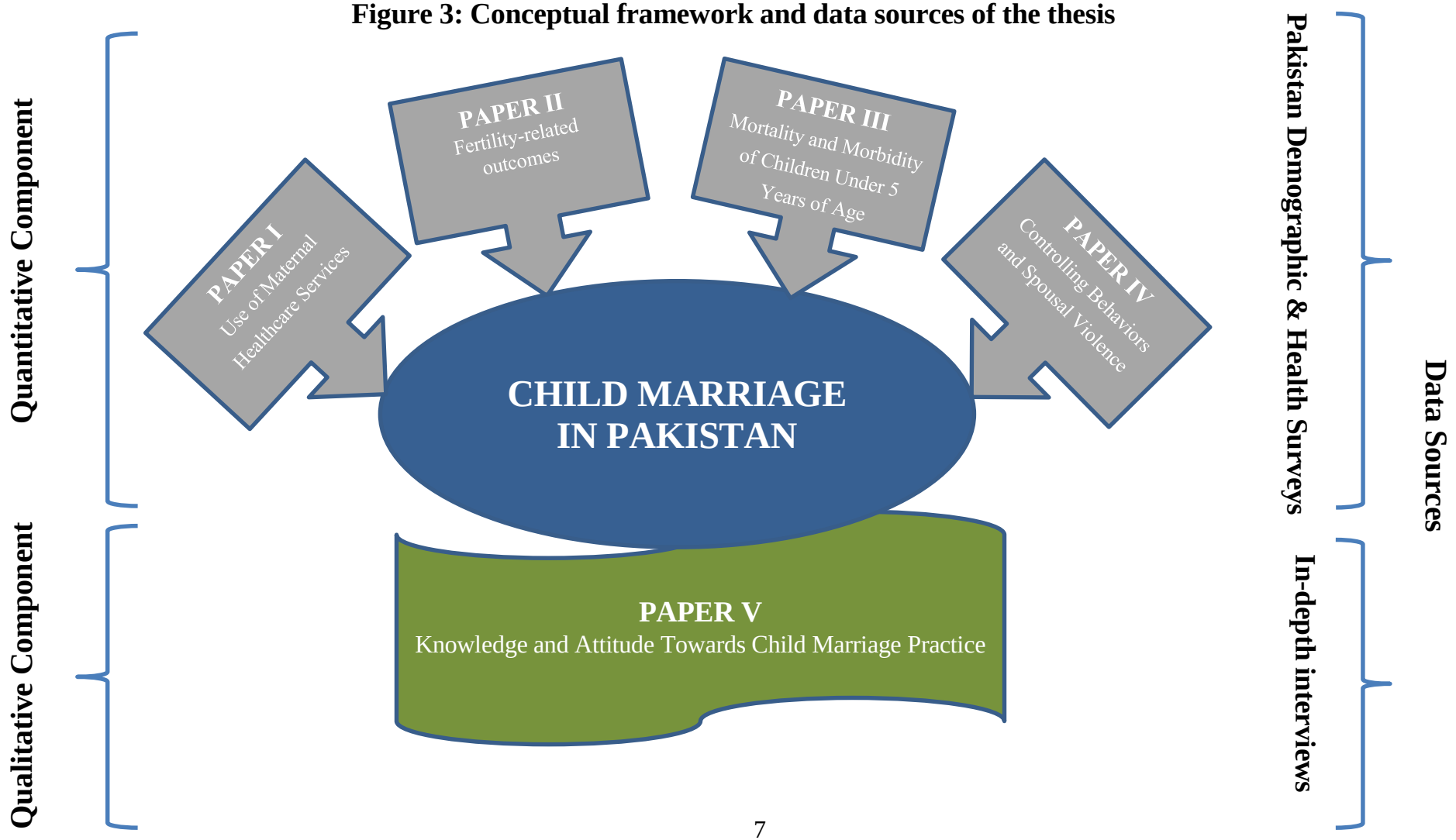
4) To determine the association between child marriage and controlling behaviors and spousal violence by husbands against adolescent and young women in Pakistan beyond those attributed to social vulnerabilities.

5) To describe women's knowledge and attitude towards child marriage practice who themselves were married as children to gain insight, especially cultural factors for designing future interventions.

METHODS AND MATERIALS

The thesis comprised of quantitative analyses of cross-sectional nationally representative data from the Pakistan Demographic and Health Survey, 2006-2007 (Paper I, II, III) and 2012-2013 (Paper IV), and qualitative analyses of data from in-depth interviews (Paper V). The conceptual framework along with data sources of the thesis is shown in Figure 3.

Figure 3: Conceptual framework and data sources of the thesis



In Table 1, we summarized the characteristics of studies that form the four papers of the thesis. These methods are described in separate sections below.

Table 1: Characteristics of studies in paper I, II and III, IV

	Paper I	**Paper II**	**Paper III**	**Paper IV**
Study setting	Pakistan (nationally representative data)	Pakistan (nationally representative data)	Pakistan (nationally representative data)	Pakistan (nationally representative data)
Years	2006-2007	2006-2007	2006-2007	2012-2013
Study sample	1,404 (from total of 10,023)	1,560 (from total of 10,023)	2,630 (from total of 39,049)	589 (from total of 3,687)
Inclusion criteria	Ever-married women aged 15-24 years with at least one childbirth	Ever-married women aged 20-24 years	Children from the past five years, as reported by ever-married women aged 15-24 years	Currently married women aged 15-24 years who participated in violence module.
Exposure variable	Child marriage (<18 years)	Child marriage (<18 years)	Child marriage (<18 years)	Child marriage (<18 years)
Outcome measures	1. Any prenatal care (skilled or unskilled providers) 2. Prenatal care by skilled medical providers 3. Number of antenatal visits 4. Antenatal care during last antenatal visit 5. Any antenatal care (hospital or home) 6. Antenatal care at home 7. Assistance with delivery by unskilled medical care providers 8. Place of birth	1. Childbirth in first year of marriage 2. At least one childbirth 3. Three or more childbirths 4. Repeat childbirth in less than 24 months 5. At least one unwanted pregnancy 6. At least one pregnancy termination	1. Diarrhea in past 2 weeks 2. Acute respiratory infection in past 2 weeks 3. Acute respiratory infection with fever in past 2 weeks 4. Children under 5 years of age mortality (< 5 years) 5. Infant Mortality (< 1 year) 6. Low birth weight	1. Marital control by husbands over their wives. 2. Ever experienced emotional violence. 3. Ever experienced physical violence.
Covariates	Participant age, level of education, national region of residence, area of residence, wealth index, ethnicity, husband's education, employment status	Participant age, level of education, national region of residence, area of residence, wealth index, ethnicity, ever used contraception, marriage duration, husband's desire for more children, son preference	Age of child, sex of child, multiparous births, maternal age, maternal education, maternal ethnicity, national region of residence, area of residence, wealth index	Participant age, level of education, national region of residence, area of residence, wealth index, ethnicity, husband's education, husband ≥10 years older than wife

I- QUANTITATIVE COMPONENT OF THE THESIS

Papers I, II, III, IV comprised of the quantitative component of the thesis.

Study Setting

The studies are based on a nationally representative data of Pakistan (Figure 3). Pakistan, a low income country is located in Southern Asia that borders Arabian Sea, between India on the east and Iran and Afghanistan on the west, and China in the north [40]. According to the estimates of 2014, Pakistan is ranked the seventh most populous country in the world with a population of 196 million [55]. Administratively, Pakistan has four provinces Punjab, Sindh, Balochistan, North West Frontier Province [NWFP] (now known as Khyber-Pakhtunkhwa) along with Federally Administrative Tribal Areas (FATA) and the Federally Administrative Northern Areas (FANA) (now known as Gilgit-Baltistan region) (Figure 1). Punjab is the most populous province of Pakistan and accounts for about 56% of total population. Sindh is the second most populous province with about 23% population, followed by NWFP and Balochistan with a population of 17% and 5% respectively. FATA accounts for only 0.5% of total population, and FANA has the population of 883,799 [56]. Pakistan is a Muslim majority country with 96% of its population is Muslim [40]. Around 22% of the population is between ages 15-24 years [40].

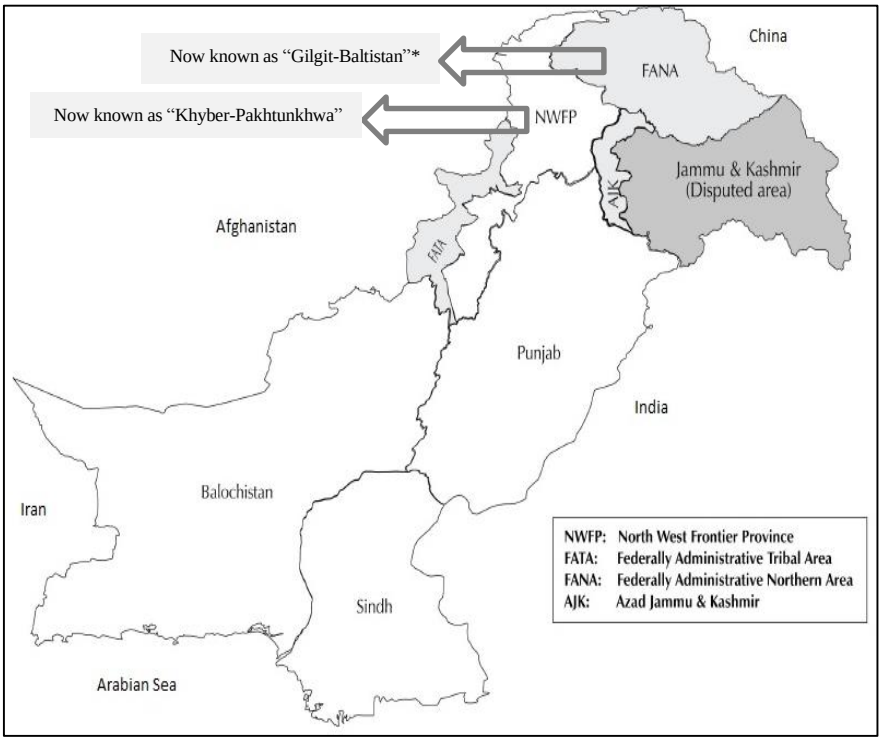


Figure 4: Map of Pakistan (adapted from National Institute of Population Studies and Macro International Inc., 2008 [36])
(Shaded areas were not surveyed in the Pakistan Demographic and Health Survey, 2006-07)
*Gilgit-Baltistan was surveyed in the Pakistan Demographic and Health Survey, 2012-13

Pakistan Demographic Health Survey – Sample Design and Response Rate

The second and third Pakistan Demographic and Health Surveys (PDHSs) under the umbrella of the global program of Demographic and Health Surveys was carried out by the National Institute of Population Studies (NIPS), Islamabad, Pakistan and Macro International Inc. (now ICF International) Calverton, Maryland, USA between September 2006 - February 2007 [36] and October 2012 and March 2013 [57] respectively. PDHSs are one of the largest household-based surveys on demographic and health issues in Pakistan. The main purpose of PDHSs was to provide detailed national information on fertility, family planning, infant, child and adult mortality, maternal and child health, nutrition, and knowledge of HIV/AIDS including sexually transmitted infections and other illnesses like Tuberculosis, Hepatitis B and C to policymakers and planners of the country [36, 57]. Domestic violence module was introduced in PDHS, 2012-13 for the first time.

Trained interviewers administered the survey in either national language (Urdu) or one of three regional languages (Punjabi, Sindhi, and Pushto) depending on the preference of household members. In both surveys, a nationally representative household-based sample was obtained by a two-stage, stratified, random sample design [36, 57]. FATA, and restricted military and protected areas were excluded from both surveys due to security and political reasons [36, 57]. FANA, now called as Gilgit-Baltistan was excluded in PDHS, 2006-07 [36] but was included in the PDHS, 2012-13 [57].

In PDHS, 2006-07, during the first stage clusters were selected with probability proportional to size. Urban areas were classified into large cities (capital cities and cities with over 1 million population), small cities (population 50,000- 1 million), and towns (population < 50,000), while all rural areas were assumed to be countryside. The smaller provinces (e.g., Balochistan and NWFP) as well as urban areas were over-sampled. In urban areas, the sample points were selected from a frame including households maintained by the Federal Bureau of Statistics. The frame for rural areas consisted of the list of villages enumerated in the 1998 population census. In both urban and rural areas, households were selected in second stage by systematic random sampling technique. In the 9,255 households interviewed a total of 10,601 ever-married women aged 15-49 years, of whom 10,023 were successfully interviewed, yielding a response rate of 95 percent. More details are mentioned in the Appendix.

In PDHS, 2002-13, during the first stage, from the universe of all urban and rural areas of the four provinces of Pakistan and Gilgit Baltistan, all urban cities and towns were divided into smaller areas known as enumeration blocks. The enumeration blocks contained an average of 200–250 households that were further categorized into low-, middle-, and high-income groups. In both urban and rural areas, households were selected in the second stage by the systematic random sampling technique. In the 12,943 households interviewed, a total of 14,569 ever-married women aged 15-49 years were identified, of whom 13,558 were successfully interviewed, yielding a response rate of 93%. A domestic violence module was implemented only in a subsample of households. One ever-married woman per household was selected and 3,687 women were successfully interviewed for the violence module. More details are mentioned in the Appendix. It should be noted that the 2006-07, and 2012-13 PDHS and all preceding surveys undertaken by the NIPS considered the age at marriage as the date the marriage was consummated. In Pakistan, the contract of marriage is sometimes finalized months or years before the time the husband and wife actually start living together. The ceremony in which the contract of marriage is signed is called *Nikah*, whereas the subsequent ceremony after which the bride and the bridegroom start living together is called *Rukhsati*. Because of interest in the marriage as it affects exposure to the risk of pregnancy, interviewers were instructed to ask the questions about marriage not in the sense of formal marriage, but as cohabitation. The detailed methodology of data collection, processing and management, training of the field staff, field supervision and monitoring, and challenges in the field by data collectors has been described elsewhere [36, 57].

Study Sample

In paper I, of 10,023 ever-married women aged 15-49 years who were successfully interviewed in PDHS, 2006-07 the sample was limited to ever-married women aged 15-24 years with at least one childbirth (n=1,404; 14.0% of the sample aged 15–49 years). Our sample focused on 15-24 year-old mothers to ensure inclusion of a population that reflects current marriage practices and the population's health care utilization in Pakistan [28]. In paper II, the sample was limited to ever-married women aged 20–24 years (n=1,560; 15.6% of the sample aged 15-49 years). This age range among ever-married women was used to allow estimating of recent rates of girl child marriage while still providing sufficient time for comparison of those married as minors versus those married as adult [15, 37, 58]. In paper III, the sample was limited to living children from the past five years, as reported by ever-married women aged 15-24 years (n=2630 births of n= 2138 mothers). A subsample of live births was used (n=1991 living children under 5 years of age born to n=1315 mothers) for child health indicators related to the current health of child. Our sample focused on 15-24 year old mothers to ensure inclusion of a population that reflects current marriage practices and its association with infant and child health in Pakistan [28]. In paper IV, of 3,687 ever-married women who were successfully interviewed for the violence module in PDHS, 2012-13 the sample was limited to currently married women aged 15-24 years who had participated in the domestic violence module (n=589, 16.0% of the sample aged 15-49 years).

Exposure Variable

We considered child marriage as an exposure variable for papers I, II, III, IV which was defined as marriage before 18 years of age [1, 2, 4, 7, 59].

Outcomes Measures

In paper I, we assessed eight outcomes (Table 1). Prenatal care given to the participant prior to the birth by skilled medical providers was assessed by questions whether the prenatal care was given by a doctor, nurse, midwife or lady health visitor. Prenatal care given to the respondent prior to the birth by unskilled medical providers was assessed by questions whether the prenatal care was given by a traditional birth attendant often called "Dai," Homeopath, Hakim or Dispenser. Prenatal care given either by skilled or unskilled medical provider was defined as "any form of prenatal care" to the participant. Based on World Health Organization (WHO) recommendations to have at least four visits for sufficient prenatal care without complications [43], the number of antenatal visits of respondents were dichotomized by less than four visits or four or more visits during the pregnancy. Care given during the last antenatal visit for the pregnancy was assessed by questions whether participants were weighed, had their blood pressure checked, or had their urine or blood examined. Antenatal care at home and hospital were assessed by questions whether the antenatal care was received by respondent at home, government hospital, government health center or private hospital. Antenatal care received either at home or hospital was defined as "place of any form of antenatal care" received by the participant. The terms "prenatal care" and "antenatal care" are interchangeable in the field of Obstetrics and Gynecology, however we stick to the terms as used in the data variables from PDHS. Assistance with the delivery of child by an unskilled medical provider was assessed by questions whether the assistance was provided by a traditional birth attendant (Dai), Homeopath or Hakim. Place of delivery was assessed by questions whether the child was delivered at home or any place other than home.

In paper II, we assessed six outcomes (Table 1). Childbirth in the first year of marriage was assessed by a question about the duration of first marriage before first birth; women who had not given birth were classified as not having childbirth in the first year of marriage. High lifetime fertility was assessed by the participants' numbers of childbirths, which was assessed by a question of total number of children ever born during the lifetime, and those who had three or more childbirths [58]. Rapid repeat childbirth was defined as a repeat childbirth in less than 24 months, which was assessed by questions about the number of months between each childbirth [58]. Whether women ever had an unwanted pregnancy was assessed by a question whether a woman wanted the child at birth, wanted the child later, or did not want any more children. Participants were categorized as having an unwanted pregnancy if they reported a pregnancy within which they wanted the child later or did not want any child. We assessed pregnancy termination by a question if a participant's pregnancy had ever resulted in miscarriage, abortion, or stillbirth.

In paper III, we also assessed six outcomes (Table 1). All outcomes were computed to assess whether children under 5 years of age had a specific health concern when alive or dead during this time period. Whether the child had diarrhea was assessed by a question if the child had diarrhea in the last 24 hours and within the last two weeks. Acute respiratory infection (ARI) was assessed by two questions, i.e. whether the child had suffered from a cough and rapid breathing in the last two weeks. ARI with fever was assessed by questions, whether the child had fever along with cough and rapid breathing in the last two weeks. Neonate, infant and child mortality outcomes were dichotomized, with neonate mortality defined as death within the first month of life. Infant mortality was defined as death of the infant before the first year of his or her birthday [36]. Child mortality was defined as death between the 12 months and 59 months of life. Child mortality under 5 years of age was defined as death of a child before the fifth birthday. Birth weight obtained from infant's medical record or maternal recall was dichotomized with weight less than 2500 gram vs. ≥2500 gram. However, a large proportion of births occurred at home and it was therefore, difficult to obtain the weight of these births; mother reported a birth weight for only one in ten births in PDHS [36]. Mothers who did not report a birth weight were asked to report the size of

the child at birth, which was dichotomized as "very small or smaller than average" and "average or larger." A large proportion of these two variables was missing, however combining the replies of both of these questions improved the validity of low birth weight outcome.

In paper IV, we assessed three outcomes (Table 1). The degree of *marital control* that husbands exercise over their wives was assessed by the questions: is the husband jealous if his wife talks with other men, does he accuse his wife of being unfaithful, does he refuse to permit his wife to meet her female friends, does he try to limit his wife's contact with her family, and does he insist on knowing where his wife is? [57]. The *emotional violence* of the participant's husband against his wife was assessed by the questions: had the participant ever been humiliated, threatened, or insulted by her husband? [57]. The extent of *less severe physical violence* by a participant's husband against his wife was assessed by the questions: had the participant ever been pushed, shaken or had something thrown at her, been slapped, punched with a fist or hit by something harmful, or had her arm twisted or hair pulled by her husband? [57]. The extent of *severe physical violence* by a participant's husband against his wife was assessed by the questions: had the participant ever been kicked or dragged, strangled or burnt, or threatened with a knife/gun or other weapon by her husband? [57]. *Any physical violence* by a participant's husband against his wife was assessed by whether the participant had ever experienced less severe or severe physical violence from her husband.

Covariates

In paper I, II, III, IV the demographics of the participants were assessed by questions regarding age at interview, level of education (no education, primary education, secondary education, higher education), area of residence (rural, urban), national region of residence (Punjab, Sindh, NWFP/ Khyber-Pakhtunkhwa, Balochistan), and ethnicity (Urdu, Punjabi, Sindhi, Pushto, Balochi, Siraiki, Other). Primary education comprised of classes 1 through 5, secondary education from classes 6 through10, and any level of education from class 11 or more was labelled as higher education [36]. A wealth index was calculated in quintiles based on ownership of consumer items and dwelling characteristics between 1 (poorest) and 5 (wealthiest). Household's cumulative living standard is measured using a composite measure of the wealth index [60]. Demographic Health Surveys staff calculated the wealth index using easy-to-collect data on a household's ownership of selected assets, such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities [60]. After collecting information on the asset of each household, Demographic Health Surveys staff assigned a weight or factor score using statistical procedure known as principal components analysis. The scores are then standardized to normal distribution curve, and later used to create break points known as wealth quintiles, Lowest, Second, Middle, Fourth, and Highest [60].

In paper I, we considered a separate variable of employment status of the participant. Participants' employment status was assessed by a question whether the respondent was currently working. In paper II, we considered three additional variables that may be related to fertility-related outcomes. Contraception use was assessed by a question whether a participant ever used a modern, traditional or any other method of contraception. Culture-specific factors were assessed by two variables, husband's desire for more children and son preference. Husband's desire for more children was assessed by a question "whether the respondent believes her partner wants the same number of children, more children or fewer children than she wants herself." The variable was dichotomized by categorizing if partner wants same or fewer children vs. more children. Preference for son was calculated from ideal number of boys and girls that the respondents would have liked to have in their whole life. In paper III, we considered an additional maternal demographic variable, age at the time of first birth, and for each live births, demographics of children such as current age of the child, sex, and whether the child was born as a multiparous birth. Additional variables of antenatal visits and breastfeeding practice were also considered. Antenatal visits were dichotomized whether mother received antenatal care during the pregnancy or not. The breastfeeding practice among mothers was assessed by a question whether mothers were either currently breastfeeding, had breastfed in the past or never breastfed their children. The

variable was dichotomized whether mothers breastfed their child (currently breastfeeding, had breastfed in the past) vs. never. For each live birth, questions were asked about the current age of the child, sex, and whether the child was born as a multiparous birth. In paper IV, we considered two additional variables husband's education, and older husbands that were 10 or more years older than his wife. Child marriages are found to be associated with a large spousal age gap, nationally and internationally [1, 2, 9, 10].

Statistical Analysis

The prevalence of child marriage and its descriptive statistics was calculated for the total sample of selected women. The characteristics of child marriage were compared with adult marriage using Chi-square (categorical variables) and Student's t (continuous variables) tests. We considered two-tailed $p<0.05$ to be statistically significant. Associations between child marriage and maternal and child health outcomes were assessed by calculating unadjusted odds ratios (OR) and adjusted odds ratios (AOR) with 95% confidence intervals (CI) using logistic regression models after controlling for age, social equity indicators (education, wealth index, rural residence), national region of residence, and specific confounders in each of the separate paper. To further explore the relationship of child marriage and maternal and child health outcomes, we performed nuanced analysis by age of marriage and compared women married at ages <14 years, 14-15 years, 16-17 years with those married at age ≥18 years (only for Papers II, III). We assessed model-fitting to avoid over saturation of the regression models. Co-efficients of independent variables were examined using Spearman correlation test to determine possible collinearity. The models were not adjusted for ethnicity because of collinearity with region of residence.

All the data were weighted and analyzed using SPSS (IBM SPSS Statistics for Windows, Version 19.0. Armonk, NY: IBM Corp.). Weighting is performed to establish in a selected sample the same distribution of variables as observed in the population. Statistical inference for prevalence and population estimates are weighted to account for complex sample design such as stratified sampling, probabilities of unequal sample selection between regions, and non-response. Using national level weights, therefore allows us to produce nationally-representative estimates. We calculated weighted percentages of the national population including the absolute numbers of participants from the original sample. Weighted percentages without the absolute numbers of participants are presented in the text.

II- QUALITATIVE COMPONENT OF THE THESIS

Papers IV comprised of the qualitative component of the thesis.

Study Setting

Participants were recruited from urban slums of Lahore city, Pakistan. Lahore is the second most populous city in Pakistan with a population of over seven million [40]. According to the Population Association of Pakistan, 23.5 % of the population of Lahore city is comprised of women of reproductive age, and 61% of women aged ≥15 years are married in the city [61]. We randomly selected six localities from two administrative towns with the most populous slum areas.

Selection and Recruitment of Participants

Data for this paper was drawn from in-depth interviews conducted with 19 pre-identified married women of reproductive age (15-49 years). Participants were selected for interview if the woman 1) was married before the age of 18 years (child marriage) 2) was married for at least 5 years, and 3) had at least one childbirth. Reasons for setting the said selection criteria were to make sure that the interviewee had a prenatal and postnatal experience and that they have spent a considerable time in marital union. Participants fulfilling the above-mentioned inclusion criteria were recruited from the localities by identification from a gatekeeper. Two gatekeepers who were employees of a non-governmental organization (NGO) in each of the selected towns helped the researchers in identification of the participants. The reason for seeking help from NGO workers is because of their efficient networking within the community and localities at household level. The NGO workers facilitated researchers in

gaining access to the women of the families that resulted in a higher response rate and reduced the chances of a negative reaction from the male heads of the families. The NGO workers arranged the interview time and place as per convenience of the participants.

A total of 20 participants were approached by the researchers, of which 19 agreed to participate. The interviews were conducted during a period of 16 weeks (June to September 2013). The majority of interviews (52.6%; 10 of 19) were conducted at the participants' homes when they were alone during the daytime. The remaining 9 interviews (47.4%) were conducted at the NGO workers' office because of privacy and convenience of the participants.

Data Collection

Themes for the interview were developed using published scientific literature and everyday observations of the researchers. The in-depth interview guide was drafted and revised a few times by the researchers, and later field tested on two participants. The guide was further revised based on the feedback received from these two participants. Data collection was conducted by two well-trained and experienced interviewers. The interview time varied in length from one to one and a half hour.

The interviews were open-ended and carried out in a conversational style. In-depth semi-structured face-to-face individual interviews were conducted and transcribed in a separate room to maintain the privacy of the participants. The researchers established a rapport with participants for 10-15 minutes before the start of each session by sharing their respective experiences of married life. Each interview was followed by a 10 minutes closing casual conversation. Field notes and casual encounters with participants were also noted by the interviewers during the interview.

Data Management and Analysis

In-depth interviews were conducted in Urdu language, as most of the participants were illiterate and were not well-versed with English. The note-taking was also done in Urdu language. All of the interviews were tape-recorded with the permission of the participants. Urdu transcripts were then translated into English and then back translated for accuracy and quality of translation by one of the interviewer. All of the transcribed interviews / discussions, memoranda, and field notes were entered into Microsoft Excel. A coding system was organized and themes were manually interpreted. A scheme of numbers and letters were used to designate major categories and subcategories. Hard copies of all computer files of data were also coded using colored pens to mark the margins with appropriate numbers and letters, whenever needed. Transcripts were then analyzed and categorized into themes.

ETHICAL CONSIDERATIONS

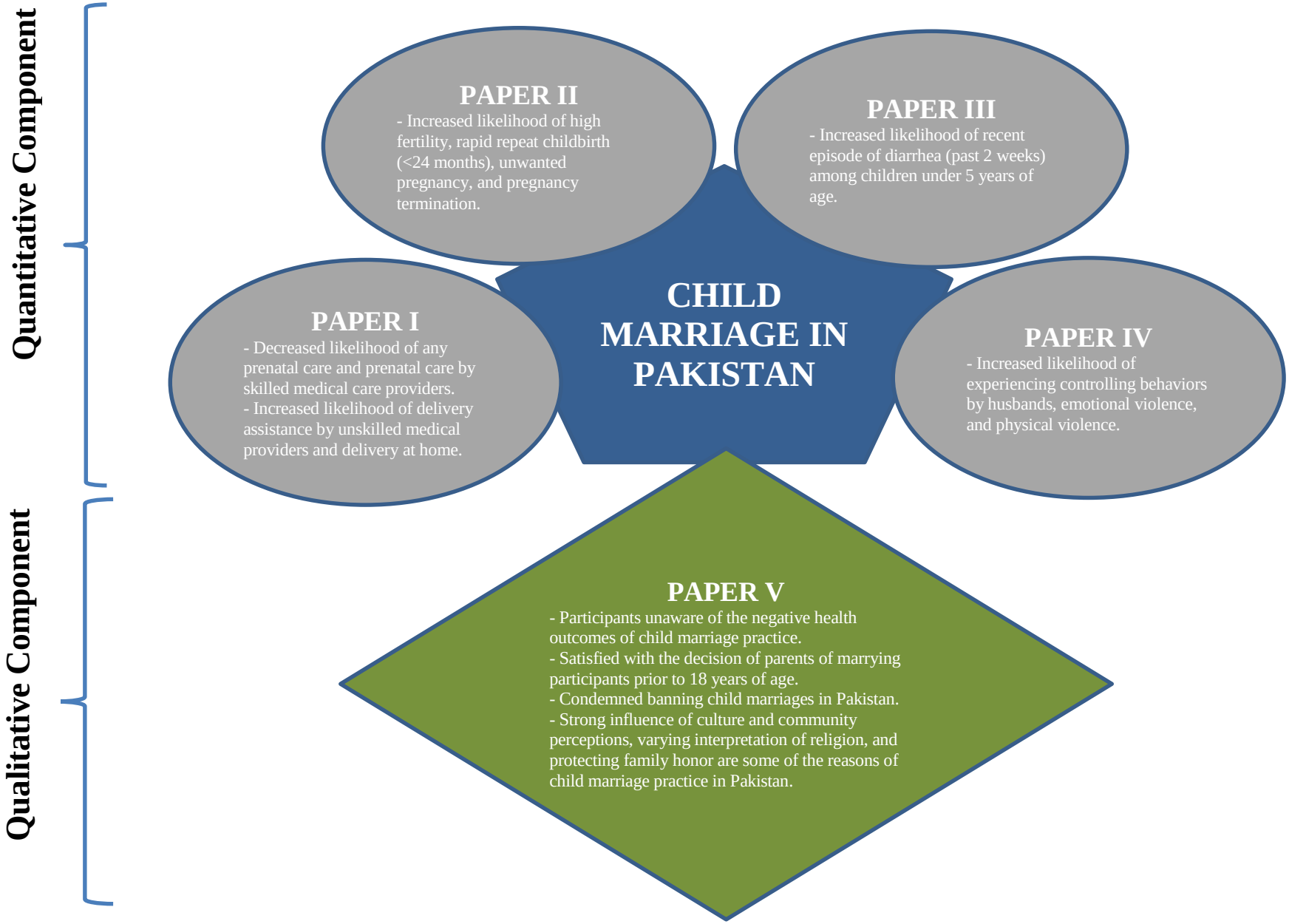
The demographic health survey procedures included in the paper I, II, III were approved by ICF Macro International institutional review board and the ethics review boards of the government of Pakistan. Because this manuscript involved secondary data analysis of a publically available dataset, ethical approval from our respective institutions was not required.

In paper IV, respondent’s safety, privacy and anonymity was maintained during the recruitment and interviews of the participants as described in the WHO guidelines[62]. The procedure of consent was also followed as described in the WHO guidelines. Written informed consent was obtained after the interviewer explained the participants, the aim, objectives, themes of discussion, researcher’s background, and details of the project. The interviews with the participants were voluntary, and they were allowed to discontinue the interview at any time. During the interview, no personal information like addresses and phone numbers were collected. Names of the participants were converted into unique dummy names for the purpose of analysis. The study methodology was reviewed and approved by Institutional Review Board (IRB) of University of the Punjab, Lahore, Pakistan on April 25, 2013 (reference number: D/688/FBSS).

RESULTS

In Figure 5, we summarized the overall results of studies that form the five papers of the thesis. The details of results are described in separate sections below.

Figure 5: Diagrammatic representation of significant associations between child marriage and maternal and child health



I- QUANTITATIVE COMPONENT OF THE THESIS

Child Marriage Practice and Sample Characteristics

Child marriage practice was found prevalent in Pakistan. In paper II, among the sample of ever-married women aged 20-24 years (n=1,560) the mean age of first marriage was 17.52 years (standard deviation [SD] 2.68 years). Five percent, 23.7% and 50.1% of participants were married at the age of <14 years, <16 years and <18 years respectively. In paper I, among the sample of ever-married women aged 15–24 years with at least one childbirth (n=1,404), the mean age at first marriage was 16.58 years (SD 2.40 years). Of participants with at least one child birth, 4%, 33.6% and 66.1% were married below the age of 13 years, 16 years and 18 years, respectively. In paper III, among births in the past five years to ever-married women aged 15-24 years (n=2630) there were 1991 live births with a mean current age of 1.6 years (SD=1.37) of the child. Among births in the past five years (n=2630), 23.8% births were from mothers who had only one child, 33.9% had two children, 23.0% had three and 19.3% had four or more children with only 1% reported as multiparous births. Among these births (n=2630), 74.5% births were from mothers aged <18 years. Subsequently, 43.5% and 6.4% births were from mothers aged <16 years and <13years respectively. In paper IV, among currently married women aged 15-24 years who participated in domestic violence module, the mean age was 21.46 years (SD 2.02 years). The median age of participants' husbands was 27 years (minimum=16 years, maximum=60 years). Around 30% of the participants reported that they had been married for a total of 5–9 years. The most participants (47.8%) were married before the age of 18 years. Around 3% and 13% of participants were married before the age of 14 years and 16 years, respectively. Of those married before the age of 18 years, around 54% of the participants reported that they had been married for a total of 5–9 years.

Social Vulnerabilities

In paper I, there were significant differences in demographics and social equity indicators among women who were married younger than 18 years of age compared with those who were married at ages18 years or older ($p<0.05$). A higher proportion of women married as children were young, uneducated, poor and resided in rural areas (Table 2). The proportion of women married as children was also higher among Siraikis, Pashtun and Baloch relative to other ethnic groups.

Table 2: Prevalence of ever-married women aged 15–24 years with at least one childbirth who were married as children vs. adults by social equity indicators, Pakistan Demographic and Health survey, 2006-2007

Characteristics	Total Participants (N=1404)		Child Marriage (N=934)		Adult Marriage (N=470)		P-value
	n	Weighted %	n	Weighted %	n	Weighted %	
Age of participant (years)							<0.001
15	3	0.2	3	100.0	0	0.0	
16	20	1.2	20	100.0	0	0.0	
17	30	2.2	30	100.0	0	0.0	
18	93	6.9	93	100.0	0	0.0	
19	93	6.7	84	92.2	9	7.8	
20	230	16.1	175	74.8	55	25.2	
21	157	10.4	110	72.3	47	27.7	
22	274	21.3	159	57.3	115	42.7	
23	223	15.1	106	46.3	117	53.7	
24	281	20.0	154	53.9	127	46.1	

							Results
Highest level of education							<0.001
No education	872	61.9	632	72.3	240	27.7	
Primary	259	19.1	171	64.5	88	35.5	
Secondary	218	15.6	119	53.1	99	46.9	
Higher	55	3.4	12	21.7	43	78.3	
Area of region							0.001
Punjab	507	51.7	306	61.2	201	38.8	
Sindh	464	28.9	329	71.9	135	28.1	
North West Frontier Province	300	15.3	212	72.5	88	27.5	
Balochistan	133	4.2	87	62.5	46	37.5	
Type of place of residence							<0.001
Urban	471	29.0	281	58.9	190	41.1	
Rural	933	71.0	653	69.1	280	30.9	
Wealth Index							<0.001
Poorest	309	22.0	242	78.5	67	21.5	
Poorer	350	24.3	252	73.3	98	26.7	
Middle	272	20.1	187	67.6	85	32.4	
Richer	257	18.6	161	61.5	96	38.5	
Richest	216	15.0	92	40.4	124	59.6	
Ethnicity							<0.001
Urdu	65	4.9	23	33.3	42	66.7	
Punjabi	318	32.0	170	54.5	148	45.5	
Sindhi	246	14.7	179	73.0	67	27.0	
Pushto	312	15.5	225	74.3	87	25.7	
Balochi	82	4.0	62	74.1	20	25.9	
Siraiki	244	20.0	175	76.3	69	23.7	
Other	137	8.9	100	74.2	37	25.8	
Partner's education							
No education	432	30.9	312	71.9	120	28.1	<0.001
Primary	237	17.7	179	76.6	58	23.4	
Secondary	525	37.8	329	63.3	196	36.7	
Higher	203	13.6	110	48.1	93	51.9	
Respondent currently working							0.011
No	1102	77.5	710	64.4	392	35.6	
Yes	300	22.4	223	72.3	77	27.7	

-Data are weighted % of participants in each subsample while numbers are absolute participants.
-Absolute number of participants does not perfectly correspond to percentages because the percentages in each subsample are weighted.

In paper II, there were significant differences in demographics and social equity indicators among women aged 20-24 years who were married younger than 18 years compared to those who were married at 18 years or older ($p<0.05$). The prevalence of child marriage was disproportionately more among young (61.9% vs. 46.0%), uneducated (59.8% vs. 11.0%), poorest (69.1% vs. 26.3%) girls, who resided in rural areas (54.0% vs. 40.9%) (Table 3). The prevalence of child marriage was also higher among

Balochis, Siraikis, and Sindhis relative to other ethnic groups. The prevalence of contraception was higher among women married as children as compared to women married as adults (54.9% vs. 45.1%). Women married as children as compared to adult also reported higher proportion of husband's desire for more children (59.4% vs. 40.6%).

Table 3: Prevalence of ever-married women aged 20-24 years who were married as adults or children by different characteristics including social equity indicators, Pakistan Demographic and Health Survey, 2006-2007

Characteristics	Total participants (N=1560)		Child marriage (N=782)		Adult marriage (N=778)		P-value
	n	Weighted%	n	Weighted%	n	Weighted%	
Age of women							<0.001
20	358	22.6	215	61.9	143	38.1	
21	232	14.3	124	53.4	108	46.6	
22	353	24.0	170	47.9	183	52.1	
23	270	16.6	110	39.9	160	60.1	
24	347	22.5	163	46.0	184	54.0	
Highest level of education							<0.001
No education	916	57.6	538	59.8	378	40.2	
Primary	269	18.1	134	48.2	135	51.8	
Secondary	277	18.9	99	33.3	178	66.8	
Higher	98	5.3	11	11.0	87	89.0	
Area of region							<0.001
Punjab	591	53.1	254	44.8	337	55.2	
Sindh	490	27.8	284	57.8	206	42.2	
NWFP	311	14.5	168	56.4	143	43.6	
Baluchistan	168	4.6	76	45.4	92	54.6	
Type of place of residence							<0.001
Urban	534	30.0	221	40.9	313	59.1	
Rural	1026	70.0	561	54.0	465	46.0	
Wealth Index							<0.001
Poorest	313	19.6	211	69.1	102	30.9	
Poorer	362	22.9	203	57.9	159	42.1	
Middle	303	20.0	156	51.6	147	48.4	
Richer	302	19.2	131	42.7	171	57.3	
Richest	280	18.3	81	26.3	199	73.7	
Ethnicity							<0.001
Urdu	95	6.7	22	21.8	73	78.2	
Punjabi	396	35.5	147	39.0	249	61.0	
Sindhi	271	14.6	160	60.8	111	39.2	
Pushto	326	14.1	180	58.5	146	41.5	
Balochi	86	3.8	53	61.4	33	38.6	
Siraiki	241	17.2	137	61.1	104	38.9	
Other	145	8.0	83	59.5	62	40.5	
Contraception use (ever)							0.036
No	1107	70.2	524	48.1	583	51.9	
Yes	453	29.8	258	54.9	195	45.1	

							Results
Duration of marriage (years)							<0.001
0-4	912	59.1	213	24.3	699	75.7	
5-9	590	36.9	511	86.0	79	14.0	
10-14	58	4.0	58	100.0	0	0	
Husband's desire for more children							0.001
No	854	76.9	398	47.0	456	53.0	
Yes	306	23.1	187	59.4	119	40.6	
Son preference							0.254
No	1014	66.2	493	49.0	521	51.0	
Yes	543	33.8	288	52.4	255	47.6	

-Data are weighted % of participants in each subsample while numbers are absolute participants.
-Absolute number of participants does not perfectly correspond to percentages because the percentages in each subsample are weighted.

In paper III, among births in the past five years to ever-married women aged 15-24 years (n=2630), the mean number of children born to mothers married at <18 years (2.7; SD=1.27) was significantly higher (p<0.001) than that of women married as adults i.e. ≥18 years (1.7; SD=0.81), with mothers married as minors being more likely to have three or more births (51.7% vs. 14.7%; p<0.001). A higher proportion of women married as children were young, uneducated, poor and from rural areas of Pakistan (Table 4). The breastfeeding practice was similar among those married <18 years vs. ≥ 18 years of age (93.3% vs. 92.2%; p=0.402).

Table 4: Demographics of births in the past five years to ever-married women aged 15-24 years by maternal age at marriage, Pakistan Demographic and Health Survey, 2006–2007

	Total births (N=2630)		**Births to women married <18 years (N=1965)**		**Births to women married ≥18 years (N=665)**		**P-value**
	n	**Weighted %**	**n**	**Weighted %**	**n**	**Weighted %**	
Current age of child (years)							<0.001
<1	601	27.5	357	60.7	244	39.3	
1-1.9	457	20.0	301	64.1	156	35.9	
2-2.9	381	17.0	269	73.7	112	26.3	
3-3.9	318	13.5	247	76.8	71	23.2	
4-4.9	234	10.3	203	85.0	31	15.0	
Deceased	253	9.9	211	82.3	42	17.7	
Sex							0.785
Male	1407	53.3	1055	74.8	352	25.2	
Female	1223	46.7	910	74.3	313	25.7	
Antenatal visits							<0.001
No	440	32.5	330	74.9	110	25.1	
Yes	923	67.5	570	61.3	353	38.7	
Region							<0.001
Punjab	949	50.7	659	70.5	290	29.5	
Sindh	889	30.1	692	78.5	197	21.5	

North West Frontier Province (NWFP)	582	15.7	456	80.1	126	19.9	
Balochistan	210	3.6	158	72.5	52	27.5	
Type of residence							<0.001
Urban	879	29.4	599	67.3	280	32.7	
Rural	1751	70.6	1366	77.6	385	22.4	
Mother's age at first birth							<0.001
<18 years	1244	45.9	1244	100.0	0	0.0	
18-20 years	1054	41.6	685	65.6	369	34.4	
21-24 years	332	12.5	36	10.7	296	89.3	
Mean age of mother (SD)	21.9 (1.92)		21.6 (2.02)		22.6 (1.33)		<0.001
Mother's education level							<0.001
No education	1698	64.6	1362	80.3	336	19.7	
Primary	505	19.5	376	72.7	129	27.3	
Secondary	342	13.0	202	58.9	140	41.1	
Higher	85	3.0	25	28.9	60	71.1	
Wealth Index							<0.001
Poorest	596	22.8	504	84.4	92	15.6	
Poorer	665	24.7	534	81.2	131	18.8	
Middle	536	21.4	408	75.8	128	24.2	
Richer	469	17.8	332	69.7	137	30.3	
Richest	364	13.3	187	49.6	177	50.4	
Ethnicity							<0.001
Urdu	123	5.0	61	47.7	62	52.3	
Punjabi	559	30.0	353	65.0	206	35.0	
Sindhi	476	15.4	373	78.5	103	21.5	
Pushto	594	15.7	476	81.9	118	18.1	
Balochi	138	3.6	116	83.7	22	16.3	
Siraiki	488	21.5	385	82.2	103	17.8	
Other	252	8.8	201	80.4	51	19.6	

-Data are weighted % of participants in each subsample while numbers are absolute participants

-Absolute number of participants does not perfectly correspond to percentages because the percentages are weighted

In paper IV, among currently married women aged 15-24 years who participated in domestic violence module there were significant differences in demographics and social equity indicators among women who were married before they were 18 years of age compared with those who were married at age 18 years or older ($p<0.05$). Women married as children compared with women married as adults were younger, less well educated and poorer (Table 5). The proportion of women married as children compared to adults was higher in Sindh, and Khyber Pakhtunkhwa.

Table 5: Selected characteristics of currently married women aged 15-24 years who participated in domestic violence module by marital status and social equity indicators in Pakistan, Pakistan Demographic and Health Survey, 2012-2013

	Total participants (N=589)		Child Marriage (N=297)		Adult Marriage (N=292)		P-Value
	n	Weighted %	n	Weighted %	n	Weighted %	
Age of women							<0.001
15	1	0.1	1	0.3	0	0.0	
16	8	0.9	8	2.0	0	0.0	
17	14	1.8	14	3.7	0	0.0	
18	49	9.6	38	15.2	11	4.4	
19	44	5.5	27	6.2	17	4.9	
20	85	13.6	39	10.1	46	16.8	
21	63	10.9	28	9.6	35	12.2	
22	120	20.9	54	18.6	66	23.1	
23	98	19.2	44	22.3	54	16.3	
24	107	17.4	44	12.1	63	22.3	
Respondent level of education							<0.001
No education	287	51.6	182	66.9	105	37.6	
Primary	110	20.3	48	14.7	62	25.4	
Secondary	129	20.0	55	16.1	74	23.6	
Higher	63	8.1	12	2.3	51	13.5	
National region of residence							0.011
Punjab	174	59.1	76	52.0	98	65.6	
Sindh	146	22.8	71	26.6	75	19.4	
Khyber Pakhtunkhwa	116	13.9	67	16.9	49	11.1	
Balochistan	66	3.2	35	3.4	31	3.1	
Gilgit Baltistan	59	0.7	35	0.8	24	0.5	
Islamabad (capital territory)	28	0.3	13	0.3	15	0.3	
Type of residence							0.061
Urban	234	24.7	105	21.5	129	27.6	
Rural	355	75.3	192	78.5	163	72.4	
Wealth Index							<0.001
Poorest	130	23.4	88	34.5	42	13.2	
Poorer	131	20.8	84	27.7	47	14.5	
Middle	127	22.3	61	17.2	66	26.9	

Richer	119	20.3	44	14.1	75	25.9	
Richest	82	13.2	20	6.5	62	19.4	
Ethnicity							<0.001
Urdu	51	7.5	11	4.8	40	10.1	
Punjabi	122	33.9	50	23.1	72	43.8	
Sindhi	68	10.9	39	13.8	29	8.2	
Pushto	122	13.3	69	15.2	53	11.6	
Balochi	33	8.6	20	15.2	13	2.6	
Siraiki	75	18.6	41	19.4	34	17.8	
Other	118	7.1	67	8.5	51	5.9	
Husband's level of education							<0.001
No education	164	27.7	100	32.5	64	23.3	
Primary	101	22.7	57	27.1	44	18.6	
Secondary	209	36.0	102	31.4	107	40.3	
Higher	115	13.6	38	9.0	77	17.8	
Husband 10 or more years older than wife							0.005
No	481	83.6	227	79.5	254	87.3	
Yes	105	16.4	68	20.5	37	12.7	

-Data are weighted % of participants in the subsample whereas numbers are absolute participants
-Absolute number of participants does not perfectly correspond to percentages because the percentages are weighted

Controlling Behaviors and Spousal Violence

In paper IV, overall, almost one-third of women aged 15–24 years (31.8%) reported experiencing CB by their husbands with those married as children experiencing significantly more CB compared to those married as adults (36.4% vs. 27.5%; $p<0.05$) (Table 6). Similarly, Around 26% and 22% of women reported having ever experienced emotional violence and physical violence respectively (Table 6). Emotional violence (31.6% vs. 21.4%; $p<0.05$), and physical violence (27.9% vs. 16.0%; $p<0.05$) was more prevalent among women married as children as compared to those married as adults (Table 6).

Table 6: Prevalence of controlling behaviors of husband and types of spousal violence among currently married women aged 15-24 years in Pakistan, Pakistan Demographic and Health Survey, 2012-2013

Controlling behaviors and types of spousal violence	**Married women (N=589)**	**Child Marriage (N=297)**	**Adult Marriage (N=292)**
	n (Weighted %)	**n (Weighted %)**	**n (Weighted %)**
Controlling behaviors of husband over their wife			
Any controlling behaviors of husband	206 (31.8)	113 (36.4)*	93 (27.5)*
Husband jealous if talking with other men	166 (26.7)	88 (29.3)	78 (24.3)
Husband accuses her of unfaithfulness	33 (5.1)	17 (5.4)	16 (4.9)

Does not permit her to meet her girl-friends	55 (8.1)	37 (11.6)*	18 (4.9)*
Husband tries to limit her contact with family	40 (5.0)	26 (7.1)*	14 (3.1)*
Husband insists on knowing where she is	106 (15.4)	57 (16.1)	49 (14.8)
Types of spousal violence†			
Ever any type of violence (physical or emotional)	196 (31.3)	121 (38.0)*	75 (25.1)*
Ever any physical violence (less severe or severe)	150 (21.7)	98 (27.9)*	52 (16.0)*
Ever any less severe violence	147 (20.5)	96 (25.7)*	51 (15.8)*
Ever been pushed, shook or had something thrown by husband	71 (10.6)	48 (14.6)*	23 (7.0)*
Ever been slapped by husband	140 (19.7)	91 (24.9)*	49 (15.0)*
Ever been punched with fist or hit by something harmful by husband	33 (4.3)	22 (5.9)*	11 (2.8)*
Ever had arm twisted or hair pulled by husband	54 (7.2)	34 (9.0)	20 (5.4)
Ever any severe violence	37 (5.1)	26 (7.3)*	11 (3.1)*
Ever been kicked or dragged by husband	25 (3.4)	19 (4.8)*	6 (2.1)*
Ever been strangled or burnt by husband	13 (1.3)	10 (2.3)	3 (0.5)
Ever been threatened with knife/gun or other weapon by husband	13 (1.5)	10 (2.3)	3 (0.8)
Ever any emotional violence	156 (26.3)	96 (31.6)*	60 (21.4)*
Ever been humiliated by husband	129 (20.9)	78 (24.9)*	51 (17.3)*
Ever been threatened with harm by husband	29 (3.6)	14 (3.7)	15 (3.6)
Ever been insulted or made to feel bad by husband	139 (21.9)	86 (26.8)*	53 (17.4)*

*p<0.05 (Child marriage vs. Adult marriage)
†Different types of violence are not mutually exclusive, and women may report multiple forms of violence.
-Data are weighted % of participants in the subsample whereas numbers are absolute participants
-Absolute number of participants does not perfectly correspond to percentages because the percentages are weighted

In paper IV, women married as children compared with women married as adults were more likely to have experienced CB by their husbands (OR=1.52; 95% CI: 1.117–2.082), and more likely to have ever experienced physical violence (OR=2.03; 95% CI: 1.418–2.900), and emotional violence (OR=1.70; 95% CI: 1.221–2.366). After adjustment for age, social equity indicators (education, wealth index, rural residence), ethnicity, husbands' education and husband being ≥10 years older than his wife, child marriage as compared with adult marriage was significantly associated with an increased likelihood of wives experiencing CB by their husbands (AOR=1.50; 95% CI: 1.042–2.157), physical violence (AOR=2.44; 95% CI: 1.582–3.760), and emotional violence (AOR=1.86; 95% CI: 1.254–2.767) (Figure 6).

Maternal Healthcare Services Utilization

In paper I, overall, 67.1% received some sort of prenatal care from health care providers, with 63.1% receiving care from skilled medical care providers. Only 27.7% of participants reported receiving the WHO-recommended four or more antenatal visits during pregnancy. The majority (76.0%) of participants received antenatal care in hospital setting, with 84.5% reporting that they were weighed, had their blood pressure checked, or had their urine or blood examined during their last antenatal visit. The majority (65.8%) of births took place at home, with 58.8% deliveries assisted by unskilled medical care providers. After adjustment for age, social equity indicators (education, wealth index, rural residence), partners' education and current working status of participants, child marriage was significantly associated with decreased likelihood of any prenatal care (AOR=0.73; 95%CI: 0.534-0.993) and prenatal

care by skilled medical care providers (AOR=0.64; 95%CI: 0.476-0.871), and increased likelihood of delivery assistance by unskilled medical providers (AOR=1.90; 95%CI:1.435-2.518) and delivery at home (AOR=2.17; 95%CI:1.617-2.915) (Figure 6).

High Fertility and Poor Fertility Outcomes

In paper II, overall, in a sample of ever-married women aged 20-24 years, 74.9% had at least one childbirth, 31.6% had their first childbirth during the first year of their marriage, 19.9% had high fertility (≥3 births), and 28.6% had repeated childbirths within 24 months. Adjusted logistic regression models including husband's desire for more children and son preference showed that women married as children compared with women married as adults, were more likely to have at least one childbirth (AOR=4.97; 95% CI: 2.952-8.355), had three or more childbirths (AOR=6.62; 95%CI: 3.527-12.429), had at least one unwanted pregnancy (AOR=2.90; 95% CI: 1.755-4.794), had rapid repeat childbirth (AOR: 2.88; 95% CI: 1.832-4.543), and had at least one pregnancy termination (AOR=1.75; 95% CI: 1.097-2.783) (Figure 6). Women married as children were also less likely to have childbirth in first year of marriage (AOR=0.56; 95% CI: 0.408-0.770) as compared with women married as adults.

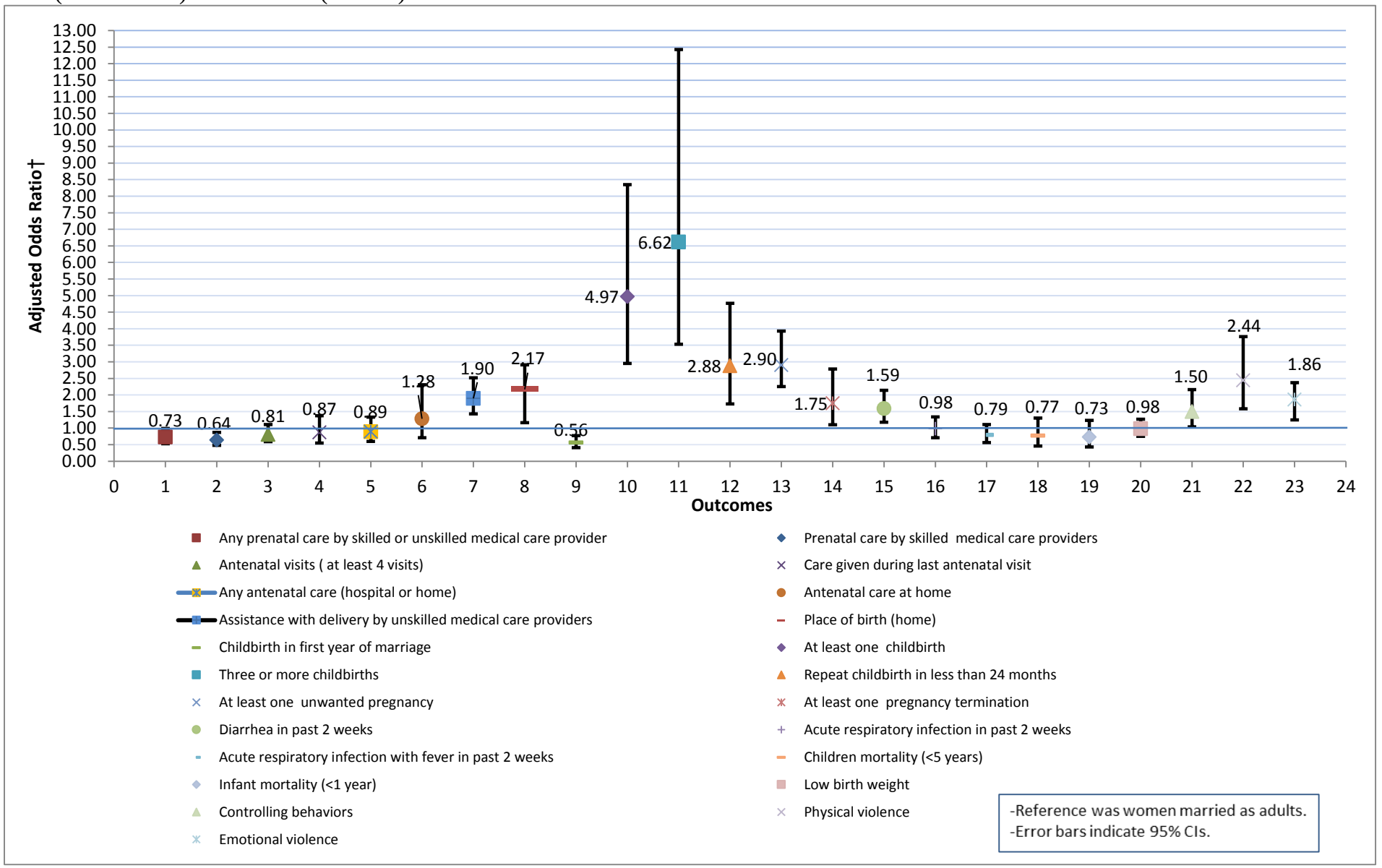
The nuanced analysis by age of marriage showed that all age groups (<14, 14-15, 16-17) as compared to those married ≥18 years were significantly associated with increased likelihood of at least one childbirth, three or more childbirths, rapid repeat childbirth, and at least one unwanted pregnancy even after controlling for demographics, and social equity indicators along with contraception use, marriage duration, and culture-specific factors (Table 7). Also, all age groups compared to those married ≥18 years were significantly associated with decreased likelihood of having childbirth in the first year of marriage. However, pregnancy termination was only found associated with women married at the ages 16-17 years as compared to those married ≥18 years.

Morbidity and Mortality of Children Under 5 years of Age

In paper III, children born to women married as children compared with those born to adult mothers were more likely to have had recent diarrhea (OR=1.27; 95% CI: 1.01-1.59). The association persisted after controlling for maternal and child demographical factors including social vulnerabilities (women economic status, education, ethnicity, and place of residence), and whether women had antenatal visits during their pregnancy (AOR=1.59; 95% CI: 1.18-2.14) (Figure 6). Child marriage was found to be associated with increased likelihood of under 5 years of age child mortality (OR=1.64; 95% CI: 1.17-2.29), and infant mortality (OR=1.53; 95% CI: 1.09-2.15). However, these associations were lost in the adjusted models (Figure 6). We did not find any relationship between child marriage and recent ARI, and fever along with recent ARI, and low birth weight (Figure 6).

The nuanced analysis by age at marriage showed that all age groups (<14, 14-15, and 16-17 years of age) compared with those married ≥18 years were significantly associated with increased likelihood of recent diarrhea in the adjusted models (Table 7). In addition, we found that women only married at the age of 14-15 years consistently had lower odds for recent ARI with fever in unadjusted and adjusted models. Child marriage also was found to be associated with increased likelihood of mortality of under 5 years of age, and infant mortality among women married at ages <14 years and 14-15 years, but the association was lost in the adjusted models.

Figure 6: Associations between child marriage and maternal and child health outcomes among women, Pakistan Demographic and Health Surveys, 2006–2007 (ever-married) & 2012-2013 (married).



†Analysis adjusted for participant age, level of education, region of residence, area of residence, wealth index, and outcome-specific variables.

Table 7: Nuanced analysis by age at marriage showing the associations between maternal child marriage and maternal and child health outcomes, Pakistan Demographic and Health Survey, 2006–2007.

Paper II			Paper III		
Health Outcomes	**OR (95% CI)**	**Adjusted OR (95% CI)† including adjustment for husband's desire for more children and son preference**	**Health Outcomes**	**OR (95% CI)**	**Adjusted OR (95% CI) including adjustment for antenatal visits**
Childbirth in first year of marriage			**Diarrhea in past 2 weeks†††**		
<14 years	0.36 (0.155-0.833)*	0.21 (0.100-0.437)*††	<14 years	1.29 (0.879-1.908)	1.94 (1.158-3.240)*
14-15 years	0.57 (0.403-0.801)*	0.54 (0.359-0.805)* ††	14-15 years	1.37 (1.049-1.795)*	1.89 (1.318-2.712)*
16-17 years	0.69 (0.501-0.946)*	0.66 (0.456-0.962)*††	16-17 years	1.19 (0.915-1.538)	1.39 (1.007-1.932)*
≥18 years	Reference	Reference††	≥18 years	Reference	Reference
At least one childbirth			**Acute respiratory infection in past 2 weeks†††**		
<14 years	20.65(7.181-59.393)*	7.86 (1.979-31.219)*	<14 years	0.78 (0.511-1.204)	1.14 (0.653-1.974)
14-15 years	6.87 (3.846-12.257)*	3.88 (1.584-9.517)*	14-15 years	0.80 (0.601-1.072)	0.73 (0.486-1.089)
16-17 years	4.23 (2.943-6.086)*	5.17 (2.962-9.033)*	16-17 years	1.03 (0.792-1.339)	1.13 (0.801-1.590)
≥18 years	Reference	Reference	≥18 years	Reference	Reference
Three or more childbirths			**Acute respiratory infection with fever in past 2 weeks†††**		
<14 years	56.88 (29.389-110.085)*	59.26 (19.782-177.553)*	<14 years	0.75 (0.465-1.196)	0.87 (0.479-1.591)
14-15 years	19.48 (12.056-31.475)*	14.84 (6.604-33.336)*	14-15 years	0.67 (0.482-0.927)*	0.56 (0.359-0.875)*
16-17 years	7.19 (4.432-11.652)*	6.02 (3.004-12.087)*	16-17 years	0.925 (0.693-1.234)	0.92 (0.639-1.338)
≥18 years	Reference	Reference	≥18 years	Reference	Reference
Repeat childbirth in less than 24 months			**Under-five children mortality (< 5 years)§**		
<14 years	10.55 (6.075-18.322)*	7.74 (3.434-17.439)*	<14 years	2.08 (1.333-3.249)*	0.61 (0.245-1.541)
14-15 years	5.49 (3.890-7.762)*	3.57 (1.948-6.556)*	14-15 years	1.82 (1.259-2.643)*	0.76 (0.410-1.424)
16-17 years	3.25 (2.350-4.493)*	2.88 (1.805-4.611)*	16-17 years	1.29 (0.874-1.909)	0.80 (0.452-1.413)
≥18 years	Reference	Reference	≥18 years	Reference	Reference
At least one unwanted pregnancy			**Infant Mortality (< 1 year)§**		
<14 years	1.92 (0.976-3.775)	5.08 (1.745-14.798)*	<14 years	2.02 (1.288-3.172)*	0.61 (0.242-1.533)
14-15 years	2.35 (1.520-3.627)*	3.85 (1.963-7.546)	14-15 years	1.70 (1.164-2.471)*	0.72 (0.381-1.348)
16-17 years	1.93 (1.286-2.906)*	2.85 (1.694-4.790)	16-17 years	1.19 (0.799-1.773)	0.75 (0.421-1.333)
≥18 years	Reference	Reference	≥18 years	Reference	Reference
At least one pregnancy termination			**Low birth weight§**		
<14 years	1.70 (0.886-3.260)	1.71 (0.706-4.159)	<14 years	1.21 (0.871-1.687)	1.02 (0.639-1.617)
14-15 years	1.93 (1.323-2.816)*	1.54 (0.786-3.027)	14-15 years	0.93 (0.739-1.182)	0.88 (0.636-1.213)
16-17 years	1.84 (1.280-2.658)*	1.78 (1.115-2.837)*	16-17 years	1.05 (0.840-1.307)	1.02 (0.961-1.081)
≥18 years	Reference	Reference	≥18 years	Reference	Reference

*p<0.05

†Analysis adjusted for participant age, level of education, region of residence, area of residence, wealth index, ever used contraception, and marriage duration

†† Not adjusted for duration of marriage since it has no bearing on the outcome.

††† Sample restricted to living children under-five in past five years (N=1991)

††† Analysis adjusted for age of child, sex of child, multiparous births, maternal age, maternal education, region of residence, area of residence, and wealth index. §Analysis adjusted for sex of child, multiparous births, maternal age, maternal education, region of residence, area of residence, and wealth index. -Data are weighted % of participants in each subsample while numbers are absolute participants. -All analyses used women married as adults as reference group

II- QUALITATIVE COMPONENT OF THE THESIS

Participant Characteristics

The age range of the participants was 21 to 34 years old. All of them were married between the ages 11 and 17 years. Almost all participants (n=18; 94.7%) were married at the time of interview and were living with their husbands or in joint/extended families with their in-laws. Only five percent (n=1) of participants were separated and living with their daughters at the time of interview. The majority of the respondents (n=11; 57.9%) were migrants to the urban city from rural areas and the rest of eight (42.1%) respondents belonged to the urban setting. Based on the occupational categories of the respondents and their husbands, fifteen respondents (78.4%) belonged to a low socio-economic class. Four of the respondents belonged to middle socio-economic class and were either housewives or working as school teachers. The majority of the respondents (n=13; 68%) were uneducated. About 15.8% (n=3) respondents had up to primary education, and the remaining 15.8% (n=3) had secondary education. More than half of the respondents (57.9%) were working as housemaids and the remaining (n=8; 42.1%) were housewives.

Perceptions about Child Marriage Practice and Awareness of its Negative Health Outcomes

A majority of the participants (13 of 19) were not aware of the negative health outcomes of child marriage practice. However, over a quarter of participants (5 of 19) believed that negative outcomes of child marriage practice were not only confined to medical grounds but that they affected the social relations negatively. These participants (5 of 19) also reported a number of health problems, which included frequent pains, disturbed menstrual cycle, abortion, difficulty in child birth and physical weakness. The women narrated that they suffer from more health problems than those in their social circle who were married after the age of twenty. Despite these health problems, the participants were unaware of the negative health outcomes of child marriages and whether these health problems might be due to their early marriages. The participants felt that they were not mature enough to handle delicate matters of child health and child bearing. The women also felt guilty that they were not capable of handling the customary obligations of married life within families and faced social stigma.

> Parents should not marry their daughters before the age of 20 because before 18, girls are not physically and mentally prepared for marriage. [Participant in early twenties, married before 18 years with secondary education]

However, the majority of women married as children (13 of 19) was satisfied and felt that their parents made the right decision of marrying them prior to 18 years of age.

> I find myself very lucky because I got such a nice, sober and caring person. I believe that girls should be married at younger age provided that there is good proposal. [Participant in early thirties, married at the age of 12 years with five years of schooling]

In contrast, a sizeable number of women (6 of 19) strongly condemned child marriages. Participants mentioned that girls must be given an opportunity to complete their education before their marriage, "Educating a daughter means educating the whole family." Few women (4 of 19) were of the view that if women are married before 18 years, they would not be able to complete their education. Furthermore, they would have less skills and competencies to care, educate and up-bring their children properly. Thus they would be unable to contribute positively to the family affairs.

> I think that early marriages most often result in conflicts, divorce, 'husband' violence, and health issues for the females. Those girls who get married at a later age are better ones…and I think girls should be allowed to complete their basic schooling first, then they should be married. [Participant in early twenties, uneducated, married at the age of 13 years]

Attitude Towards Child Marriage Practice

Intention to marry participants' daughters before 18 years

More than half of the participants (10 of 19) narrated that they would marry their daughters before the age of 18 years subject to the availability of a good marriage proposal. Moreover, participants provided

religious justification in favor of their view-point. They believed that according to the teaching of Islam it was parents' duty to marry their daughters as soon as they reach puberty. The participants mentioned a greater success and better adjustment with the extended family members if women are married before the age of 18 years.

> As I said earlier, girls should be married early. It is easier for them to adjust in their 'own' (new) home at a younger age. Women of older age usually cannot adjust with in-laws [because of their maturity] and they suffer more. [Participant in early thirties, educated till 10th grade, and married at the age of 16 years]

Only four of 19 respondents were against the marriage of their daughters before the age of 18 years. These women wanted their daughters to get education and better social status in the society.

> I have witnessed so many hardships and troubles just because of my child marriage. I will never let my daughters face those hardships and will not marry them in their childhood. Instead, I will educate them and try my utmost to give them better life and future. [Participant in late twenties, without any formal schooling, and married at the age of 12 years]

Opinion of participants whether child marriage should be continued in Pakistan

Almost half of the participants (10 of 19) were in favor of child marriage in the country, and justified the practice by narrating reasons such as better adjustment of younger girls to in-laws, avoiding social evils, delinquency, and immorality [adultery]. According to the participants, not marrying the children before 18 years could result in situations which can cause social evils, sins, and social problems.

> Access to mobile and TV cable has made the younger generation more vulnerable to many social evils. I have seen some cases where unmarried girls come to our clinic and ask for abortion of their illegal child. I am afraid of *moasharti bay rahrwi* [social evils] and I will marry my daughter [before 18] as soon as I find any suitable proposal for her. [Participant in mid-thirties, uneducated, and married at the age of 15 years]

Few participants (3 of 19) had the opinion that parents should evaluate the boy and his family before marrying their daughters, and at the availability of a good proposal, parents should marry their daughter before the age of 18 years.

> It [child marriage] is a tradition and it should be continued. But, people are so strange that they marry their daughters without any investigation about a proposal. I think so it is the *Farz* [duty] of parents to check the boy's character, his earning status and his family thoroughly before marrying their daughters. Otherwise, it is better that the daughter stays unmarried all her life rather than to be married to an irresponsible person [Participant in early twenties, educated till 10th grade, and married at the age of 13 years]

In contrast, some participants (6 of 19) had the view that girls should not be married before 18 years. Necessary education and training is a pre-requisite to lead an independent life otherwise, they would face much difficulties and challenges in their married life.

> "Girls should be allowed to express their choice of *Shareeq e hayat* [life partner] and if that proposal seems good, she should be married but preferably not before the age of 16. [Participant in early forties, uneducated, married at the age of 13 years]

Those women who favored the idea of child marriage condemned banning child marriages in the country. A vast majority of women viewed it purely a family matter in which the state should not interfere, whereas other believed that state should make and implement strict laws to prohibit child marriages.

DISCUSSION

CHILD MARRIAGE PRACTICE IN PAKISTAN

Our findings showed that half of ever-married women aged 20-24 years in Pakistan were married before the age of 18 years; nearly quarter of these women married before the legal age of 16 years (Paper II). Further, over half of women aged 15-24 years in Pakistan were not only married before the age of 18 years but also had at least one childbirth; around 34% of these women were married and had a childbirth before the legal age of 16 years (Paper I). Overall, we noted that around 75% of births in Pakistan were among women aged 15-24 years who were married before the age of 18 years (Paper III). As seen in previous studies [1, 2, 12], women who experienced greater social inequities (i.e, poverty, rural residence, no education) were at increased risk for girl child marriage (Paper I, II, III, IV), as were Balochis, Siraikis, and Sindhis compared with other ethnic groups in Pakistan (Paper II). These findings document that child marriages, while apparently less common than some of nearby nations such as India, Nepal and Bangladesh [37] remains a huge concern for Pakistan and is compromising maternal and child health of the nation.

Rural Sindh is one of the most impoverished in the country [38], which is one of the main reasons for increase in numbers of child marriages in this area. Rural Sindh has shown the highest percentage of child marriages in the country [10], where parents often sell their young girls in exchange of money offered from grooms that commonly ranges from $1400 to $5000, with groom usually many fold older than the age of brides [38]. The percentage in Rural Sindh (72%) is followed by rural Balochistan (63%) for early marriages however, Punjab province have marriages with most females marrying at later ages in both rural (50%) and urban (20%) areas [10], findings that are consistent with ours (Paper II).

CAUSES OF CHILD MARRIAGE PRACTICE IN PAKISTAN

Our qualitative data (Paper V) advance our knowledge by providing reasons for the continuation of child marriage practice in Pakistan, which were missing in the PDHS, 2006-07 and 2012-13 data. Our study in paper V gives insights to those factors that are helpful to consider while designing future interventions to eliminate the child marriage practice in the country.

Perception and Varying Interpretation of Religion

Religion was narrated as one of the reasons by the participants for continuation of child marriage practice in Pakistan (Paper V). Participants' perceives that their religion persuades parents to marry their daughters as soon they attain puberty (Paper V). It may be noted that, in Pakistan, religion has great influence in everyday life of an individual and many people justify their mundane decisions in the name of religion. The role of religion and religious leaders is profound in the country with several religious leaders having strong hold in their communities [9]. This strong influence of religious leaders may affect the willingness of parents to marry their children at much younger age. Further, varying interpretation of religion may also play a role in continuation of child marriage practice in the country. Shariah Law defines puberty/menstruation for girls and facial hair for boys to signify the time when they can get married. However, because of lack of awareness and limited knowledge, especially in the rural areas where most people are uneducated, the mandatory condition in Shariah of having mutual consent of both partners in marriage is often overlooked, which is the case most often in child marriages [10]. Secondly, some religious leaders have the opinion that both physical and psychological maturity is important before one can get married [9]. While most parents only know the aspect of physical maturity, psychological mental maturity that is required in Islam is usually ignored by parents while deciding about the marriage of their daughters [9]. Thirdly, historically transmitted powerful influence of patriarchal ideology continues to reinforce custom and traditions which put women in subservient position to men; child marriage in Pakistan may be one of the customs which could strengthen the patriarchal ideology.

Avoiding Social Evils, Delinquency, and Adultery

Avoiding social evils, delinquency, and adultery was also narrated as one of the reasons by the participants for continuation of child marriage practice in Pakistan (Paper V). According to the participants, not marrying the children before the age of 18 years could result in situations which can cause social evils, sins, and social problems (Paper V). Protecting the "family honor" is listed as one of the reasons for child marriages in earlier studies [9, 10]. The moment girls reach puberty, they are believed to be a source of attraction and lust for boys, parents thus, feel relaxed and free of burden of guarding their girls from unchastely by marrying them at an early age. By marrying girls before the age of 18 years, parents believe that this practice could protect their daughters from unwanted attention from men and likelihood of objectionable romantic relationship. Further, dropping out of girls from schools in the name of protecting family honor is an unfortunate consequence, because parents are often afraid of socially undesirable happenings at schools once their girls reach puberty [9]. According to an estimate in the year 2000, only 25% of women were able to complete their primary education as compared to 49% of men in Pakistan [8].

Traditional Cultural Practices

Primitive cultural practices, several of which are forbidden by the country's laws are prevalent in rural and tribal areas of Pakistan, such as *Watta Satta* (bartering bride for bride), *Pait Likkhi* (marrying children before they are born or are still very young), *Addo Baddo* (marriage among tribes), and *Swara / Khoon-Baha / Vani / Sakh* (girls given in marriage as a form of dispute resolution), also lead to continuation of child marriage practice in the country [10]. Even though participants in our qualitative in-depth interviews were not the victims of any of these traditional practices (Paper V), but these cultural practices are deep-rooted in the society that have been mentioned to be one of the causes for child marriages in Pakistan in earlier studies [9, 10].

Poverty

In our studies (Paper I, II, III, IV), child marriage in Pakistan seems to be related to poverty. Worldwide, poverty is one of the main factor that is found associated with child marriage practice [1, 2, 7]. Child marriage practice is common in poor countries and regions of the world, and even within these countries, the practice is concentrated in poor families [7]. In Pakistan, women are mainly considered as financial liability [8], unlike men who are considered the source of income for poor extended families, getting girls married at an early age is an easy way to avoid responsibility of feeding, clothing and education. Particularly, misusing of dowry tradition in the country, make parents marry their girls at an early age to free them from financial liability; the older the girl, the higher the likelihood of dowry demand [8, 10, 31] .

CONSEQUENCES OF CHILD MARRIAGE PRACTICE IN PAKISTAN

Maternal Healthcare Services Utilization

In rural and poor areas of Pakistan where prevalence of child marriage is high (Paper II), young girls cannot access maternal healthcare services because of their inability to afford the expensive fee-for-service health care facilities. Though the government owned healthcare facilities are free but usually fail to provide quality care due to insufficient and untrained staff and poor quality of available equipment [19, 24]. All these factors may have contributed to high maternal morbidity and mortality in the country. In earlier studies, underutilization of maternal health care services in Pakistan is attributed to low education, poverty, and lack of services especially in rural areas [22, 25, 36]. However, this may not be the only result of consequences of social vulnerability as shown in our study (Paper I). Even after controlling for social inequity indicators (poverty, rural residence, and no formal education) our study shows that women with early marriages are less likely than women with adult marriages to have prenatal care by skilled medical care providers and more likely to have delivery assistance by unskilled medical providers (Paper I), factors that lead to high maternal morbidity and mortality. More research is needed to understand why the utilization of health care services is less among women married as children. In the light of ours (Paper IV) and previous literature, women married as children are more likely to be controlled by husbands and in-laws in decision making [1, 2, 15], which is also common in Pakistan,

where husbands are usually many times older than the age of wives (Paper IV) thus limiting their role in decision-making of their own and family's well-being [8, 63]. This may explain the observed underutilization of health care services among this vulnerable group beyond social vulnerabilities, and even when the woman is employed and has educated partner (Paper I).

Further, primitive traditional cultural practices, as mentioned earlier in the section force families to get their girls married at much younger ages, thus making them socially and economically dependent on their husband support. Because of this dependence and low status, especially in rural areas women need to seek permission from the head of family to visit health services [25], thus limiting access to health care. In some cases, women are forced to deliver babies at home by traditional birth attendants (Dai), despite known for their unhygienic and unsafe practices [64] because of family tradition [23], where many of them end up in medical complications such as postpartum hemorrhage [23]. This may explain some of the reasons why in our study (Paper I) women married as children are more likely to deliver at homes beyond social vulnerabilities, and even when the women is employed and has educated partner.

High Fertility and Poor Fertility Outcomes

We found that girl child marriage was significantly associated with high fertility and poor fertility outcomes such as rapid repeat childbirth (births in <24 months), unwanted pregnancy, and pregnancy termination (Paper II). Earlier studies from the low- and middle-income countries showed that high fertility and poor fertility outcomes are associated with adolescent marriage [1-4, 65]. However, these associations seem to be related to social vulnerabilities among adolescent married women as these women are mostly poor, uneducated and reside in rural areas [1-4, 12], and are less likely to have decision-making freedom in their homes, as a result these women may not able to negotiate about the contraceptive use with their husbands [66]. However, our study (Paper II) indicated the increased risk of high fertility and poor fertility outcomes regardless of the use of contraceptive among these young women married before the age of 18 years.

Importantly, in our study (Paper II) some cultural-specific factors such as husbands desire of more children and son preference that have shown to increase the rates of fertility and low use of contraception among women in Pakistan [24, 42, 43] seems to have less impact on increased risk of high fertility and poor fertility outcomes among these young women. This enables us to ponder whether there are reasons other than mentioned above that may have direct or indirect effect on increased fertility among these young women in the country. More in-depth research is needed to understand the cultural- and behavioral-specific reasons for increase in fertility among these young women in Pakistan. Nonetheless, based on ours (Paper IV) and prior literature, women married as children are more likely to be controlled by husbands and in-laws [1, 2, 15], which is not an exception in Pakistan as well [28]. Because of dependence and low status, especially in rural areas women need to seek permission from the head of family to visit health facilities [25]. This often comes with violence from husbands if women seek health services without men permission thus limiting access to maternal healthcare services among these young women [67]. This may explain the observed high fertility and poor fertility outcomes among this vulnerable group in our study.

Diarrhea among Children Under 5 years of Age

After accounting for the social inequities, children born to women married as minors were significantly more susceptible to diarrhea compared with children born to women married as adults (Paper III), indicating that diarrheal diseases may not only be consequence of social, economic and structural vulnerabilities to these young mothers, and warrants more research in this area. Prior research has shown that adolescent mothers who breast feed produce less volume of breast milk as compared with mature breastfeeding mothers, and possibly have less production of colostrum that contains antibodies necessary for the child to fight against infections [68, 69], thus making their children more susceptible to diarrhea. Further, our research (Paper IV) and research in other countries has shown that women married as children are more likely to be controlled by husbands and in-laws [1, 2, 15]. Women, especially in rural

and poor urban areas have limited power for health-related decisions within the household [8, 54] and often need to seek permission from the head of the family to visit health facility [25], whether for their own or their children's health. It is possible that children born to mothers married as children may not receive adequate nutrition due to women's low decision-making power in the household, which may make them prone to infections, including diarrhea. Further, early marriage has been shown to be associated with high fertility with closely spaced pregnancies among these poor, less educated young mothers (Paper II), which when coupled with depletion of maternal nutrients predisposes their children to high morbidity and mortality [70].

Mortality of Children Under 5 years of Age

Women married as children had increased likelihood of mortality of children under 5 years of age, and infant mortality as compared to women married as adults (Paper III). However, the association was lost in the adjusted models after accounting for social inequities (Paper III). Although our findings are not consistent with those from other countries, which showed that adolescent mothers were more likely to have mortality of children under 5 years of age as compared with adult mothers [1, 2, 46, 51, 71, 72] our findings do not undermine the importance of delaying childbirth among those married below 18 years. Our study (Paper III) suggests that socioeconomic and structural vulnerabilities of women married as children may lead to poor children health outcomes. It is therefore, likely that efforts limiting child marriage along with delaying childbirth, and reducing socio-economic and structural vulnerabilities may decrease child mortality in young mothers in Pakistan.

Low Birth Weight Infants and Acute Respiratory Infection among Children Under 5 years of Age

Contrary to findings in other studies that showed a significant relationship between adolescent mothers and low birth weight infants and child morbidity [1, 2, 51], our study (Paper III) did not find a relationship between girl child marriage and low birth weight infants and ARI, even in the nuanced analysis by age groups at marriage. Despite social disadvantage, the proportion of low birth weight infants born to adolescent mothers was almost equal to those born to adult mothers (Paper III), and even after controlling for social inequities and antenatal visits, the association remains insignificant (Paper III). Explanation for the non-significance of child marriage and low birth weight infants is unclear because some previous studies that have shown similar findings of non-association like the one in our study (Paper III) were largely attributed to good prenatal care, high number of antenatal visits, planned pregnancies, and high-quality maternity care [73, 74], which is not the case in our study population (Paper III) i.e. women married as children in Pakistan are associated with increased likelihood of low number of antenatal visits, unplanned pregnancy, delivery assistance by unskilled medical providers and delivery at home (Paper I, II). More research is needed to study simultaneously biologic immaturity, social disadvantage and poor health practices in this setting to come up with multifactorial explanations of maternal age differences regarding birth weight. We (Paper III) also found a marginally significant relationship between girl child marriage and decreased likelihood of ARI with fever in adjusted models, particularly among women married at ages 14-15 years, suggesting that reducing socio-economic and structural vulnerabilities may decrease cause-specific child morbidity in young adolescent mothers of Pakistan.

Spousal Violence

Almost one-third of women aged 15–24 years in Pakistan reported experiencing CB by their husbands (Paper IV). This is in line with previous international literature, which has shown that women, especially in Asian [75], African [76] and Middle-Eastern regions [77], experience CB by their husbands. Our study adds to the literature by showing that, among women who experienced CB, those married as children experienced significantly more CB from their husbands as compared to those married as adults. While we cannot comment on sexual violence because of the unavailability of data in the PDHS, 2012-13 we found that after adjusting for social equity indicators, women married as children are still more vulnerable to emotional and physical violence by their husbands (Paper IV). These findings signify the role of cultural factors such as men's traditional attitude towards women, the more rigid sex-role

stereotypes, and the patriarchal non-egalitarian expectations directed toward those married as children in Pakistan, which have been shown to play a role in domestic violence against women [77].

LACK OF AWARENESS OF NEGATIVE HEALTH OUTCOMES OF CHILD MARRIAGE PRACTICE IN PAKISTAN

Over a quarter of participants in our qualitative study (Paper V) narrated that they suffered from several health problems such as frequent pains, disturbed menstrual cycle, abortion, difficulty in child birth and physical weakness, which were more than those in their counterparts who were married after the age of twenty. Despite these health problems, the participants seemed unaware of the negative health outcomes of child marriages. Although these health problems may be a direct consequence of low socio-economic status with lack of money to afford the expensive healthcare or to maintain a good diet, nonetheless it is evident from our research within Pakistan and its neighboring countries, that child marriage was found to be associated with negative fertility and fertility-control outcomes (Paper II) [58, 78], child diarrhea and malnutrition (Paper III) [28], and experience of spousal violence (Paper IV) even after controlling for social vulnerabilities such as women's economic status, education, ethnicity, and place of residence. This makes us ponder whether some of the cultural factors and attitude towards child marriage, unlike social vulnerabilities are playing a role in the continuation of child marriage practice in Pakistan. Controlling behavior of husbands and in-laws towards women married as children (Paper IV) [1, 2, 15], limited power of women for health-related decisions within the household, and lack of education and media exposure [79], especially in rural areas may explain why women in our study were not aware of negative health outcomes of child marriages.

ATTITUDE TOWARDS CHILD MARRIAGE PRACTICE IN PAKISTAN

The majority of the participants in our study narrated their willingness to marry their daughters before the age of 18 years subject to the availability of a good marriage proposal (Paper V). The participants mentioned a greater success and better adjustment with the extended family members including in-laws if women are married before the age of 18 years (Paper V). Traditionally, especially in rural areas of Pakistan where child marriage is prevalent, women are expected to stay at home as homemakers and take care of children and extended family members. The submissive role of women at home is expected even when the husbands and in-laws are abusive. Women were hesitant to file charges or report to the local police against violence on them because of societal customs that stigmatize divorce and make women economically and psychologically dependent on their relatives. Anecdotally it is believed that more the age of a girl at marriage more difficult is for a girl to get adjusted with the extended family members, it is therefore not surprising that parents marry their girls at an early age. It was rather worrisome that the majority of women married as children in our study was satisfied and felt that their parents made the right decision of marrying them as children (Paper V). It was even more disturbing that the majority of the women in our study condemned banning child marriages in the country, and viewed this purely a family matter (Paper V). The more rigid sex-role stereotypes, and the patriarchal non-egalitarian expectations directed towards women may explain the reason why most women in our study felt satisfied with the decision of their parents. However, in-depth research is needed to understand the culture- and behavioral-specific reasons for the continuation of child marriage practice and gender role in Pakistan.

LAWS AGAINST CHILD MARRIAGE PRACTICE IN PAKISTAN

Pakistan government has committed international community to eliminate customs and practices which constitute discrimination against women through CEDAW, and prohibit traditional practices that are harmful to the health of children through CRC, however the progress in reducing gender inequality and child marriage is abysmal in the country [9]. With this meager progress it is unlikely that the country would soon meet its millennium goals of universal primary education, improving maternal health, reducing child mortality, and promoting gender equality [6].

The Child marriage Act Restraint 1929 prohibits the marriages of children below the age of 16 for girls and 18 for boys [80]. According to the Child marriage Act Restraint 1929 article 2 (a) a child "means a person who, if a male, is under eighteen years of age, and if a female, is under sixteen years of age. [9]" The provisions of article 2(a) contradicts the non-discrimination provision of article 25(2) of the Constitution of Pakistan 1973, which says "There shall be no discrimination on the basis of sex alone. [9]" Further Article 2(a) is a violation of the non-discrimination provisions contained in the CRC and the CEDAW, mentioned in earlier part of the thesis. However, efforts have been made to increase the age to 18 years for girls via The Child Marriages Restraint (Amendment) Bill 2009, The Charter of Child Rights Bill 2009, and The Protection of Children Bill 2009 in recognition that the factors such as poverty, illiteracy, social and cultural practices are responsible for the prevalence of child marriages in Pakistan. Once implemented, these efforts will eliminate, at least on paper, the discriminatory provisions of age and aligning the legislation with the requirements of CEDAW and the CRC [9]. Nonetheless, significant efforts are needed on ground to tackle child marriage practice in Pakistan, and to fully comply with international human rights laws undertakings.

CHALLENGES IN MARRIAGE AND VITAL EVENTS REGISTRATION IN PAKISTAN

The Muslim Family Laws Ordinance 1961 (MFLO) in Pakistan dictate *Nikah-Naama*, a form of marriage contract that contains details including the consent of both bride and bridegroom for the marriage [9]. The MFLO also entails the strict requirement on marriage registration in compliance with the marriageable age requirements of the Child Marriage Restraint Act 1929. Section 5(1) of the MFLO says "Every marriage solemnized under Muslim Law shall be registered in accordance with the provisions of this Ordinance" [9]. The registration of Muslim marriages is carried out by *Nikah (marriage) Registrar* that is appointed by Local Councils both in rural and urban areas [81]. In urban areas, the registrar reports marriages to the office of Municipal Corporation/Municipal Committee/Town Committee and in rural areas, to the Secretary, Union Council. The registration of non-Muslim marriages is done under a set of different acts in the country. However, no arrangements exist for compilation of statistics from these records [81]. According to MFLO "Anyone who fails to register a marriage with the Nikah Registrar shall be punishable with simple imprisonment for a term which may extend to three months, or with a fine which may extend to one thousand rupees (approx. U.S $10), or with both" [9]. This mere punishment on non-compliance is not severe enough to motivate people to register marriages that further adds to already poorly enforced laws for marriage registration in the country.

The registration of vital events such as births or deaths is made compulsory in the urban areas by the Local Government Act 1979 but not so in the rural areas [81]. However, the procedures for registration of births or deaths in rural areas are followed under Basic Democracies order 1959, and Municipal Administration Ordinance 1960 [81]. The current existing civil registration system of Pakistan is deficient and is below satisfactory both in terms of scope and coverage [81]. Nonetheless, National Registration Act 1973 was introduced in order to improve the registration of vital events by the Directorate General of Registration of Pakistan [81]. Despite National Registration Act 1973, according to one estimate in 2010, around 40% of men and 52% of women are unregistered in Pakistan [52]. Given the poor civil registration system of Pakistan, and unavailability of this information at the time of marriage makes it extremely difficult for the Nikah (marriage) registrar to assess the actual age of bride and bridegroom at the time of marriage. Therefore, lack of documentation for birth registration at the time of marriage, especially in rural areas may indirectly contribute to the child marriage practice in Pakistan.

METHODOLOGICAL CONSIDERATIONS AND LIMITATIONS

Paper I, II, III, IV

Cross-sectional Study Design

Given the cross-sectional design of the studies it is not possible to assess the causal relationship between child marriage and maternal and child health outcomes. However, temporal precedence of the outcomes

may be assumed since child marriage took place before the health care utilization services outcomes (Paper I), fertility-related outcomes (Paper II), morbidity and mortality of children under 5 years of age (Paper III), and spousal violence (Paper IV).

Recall, Social Desirability and Information Biases

Bias is defined as "any tendency which prevents unprejudiced consideration of a question" [82]. In research, bias occurs when "systematic error [is] introduced into sampling or testing by selecting or encouraging one outcome or answer over others" [82]. Systematic errors in estimates are commonly referred as biases. One of the common biases in cross-sectional study, especially when the study relies on subject memory such as self-report is "recall bias" [83]. It has been found that greater the amount of time lapsed between the exposure and the recall greater the chance of recall bias in the study [83]. The data collected in PDHSs are based on self-report of women participants, the outcomes assessed are therefore, subject to recall bias. However, we limit our analyses to ever-married women aged 15-24 years (Paper I, III, IV) and 20-24 years (Paper II) that may reduce recall bias by shortening time lapsed between the exposure i.e. child marriage and the recall.

With regard to people's reports about themselves, social desirability is the tendency to respond to questions in a socially acceptable direction. This social desirability bias occurs mainly for items or questions that deal with personally or socially sensitive content [84]. Given the sensitive nature of questions in PDHSs, the participants intentionally or unintentionally may respond to these sensitive questions in a more socially acceptable manner thus likely to introduce social desirability bias in our studies. Recall and social desirability biases may have resulted in inaccurate findings or misclassification thus leading to information bias in our studies. Information bias is a systematic error in a study that arises because of incorrect information obtained on one or more variables measured in the study [85].

Confounding

Confounding is a form of bias and is a concern in epidemiological studies. A confounder is a factor that is independently associated with both the exposure and the outcome of interest [82]. Confounding occurs when one or more factors influence the association between the exposure and the outcome. One of the ways to control for confounding is by stratification and regression analysis. We controlled for social vulnerabilities (women's economic status, education, ethnicity, and place of residence) that have shown to influence child marriage (exposure) and the health outcomes in paper I, II, III, IV using regression analysis. However, there are some variables that have shown to be confounders in other child marriage studies but we were not able to control for them because of missing information in PDHSs. For instance, in paper III, maternal weight gain during pregnancy and weight status prior to pregnancy was found to be associated with the size of the infant at birth in earlier studies, the lower the body mass index (BMI) of mother the higher the likelihood of low birth weight of infant [86, 87], but due to lack of information on BMI of mothers in PDHS, 2006-07 we were not able to control for it in our adjusted models. Similarly, several environmental factors such as water, food, nutrition etc. may play a role in diarrhea occurrence and subsequent mortality in this setting that we were unable to control for in the regression models.

External Validity (Generalizability)

External validity of research design deals with the degree to which findings are able to be generalized to other groups or populations [82]. PDHSs are nationally representative household-based samples using a two-stage, stratified, random sample design. All the data are weighted to establish in a selected sample the same distribution of variables as observed in the population. Using national level weights, therefore allows us to extrapolate our findings of subpopulations under study to the whole country. Nonetheless, our findings are limited to either women aged 15-24 years (Paper I, III, IV) or 20-24 years (Paper II) of Pakistan, and are therefore not generalizable to other age groups in the country or to age groups in other countries. Similar age groups of women have been reported and used in other international publications on child marriage practice [15, 28, 58].

Internal Validity

Internal validity refers to the reliability or accuracy of the study results [82]. We used secondary data of PDHSs collected under the umbrella of the global program of Demographic and Health Surveys. Demographic and Health Surveys are nationally representative household surveys that have been conducted in more than 85 countries worldwide since 1984 [88]. The questionnaire of Demographic and Health Surveys has been standardized and pre-tested to make sure that the findings can be compared across populations overtime [88]. Further, the national coverage, high response rates, standard data collection procedures including interviewer training ensure reliability and high internal validity of the findings of Demographic and Health Surveys including PDHSs [88].

Other Limitations

FANA from PDHS, 2006-07 and FATA, and restricted military and protected areas from both PDHSs were excluded due to security and political reasons [36]. The exclusion may have underestimated the overall prevalence of child marriage among ever-married women in Pakistan (Paper II), however it is unlikely to affect the association analyses. Further, in paper III, mothers reported a birth weight for only one in ten births in PDHS, 2006-07 [36], though we combined birth weight and self-reported size of the child at birth to increase the validity of low birth weight outcome but the reliability of this outcome may be compromised. Sexual violence is usually accompanied with physical violence, however due to lack of data on sexual violence in the PDHS, 20012-13 we were unable to assess its prevalence and association with child marriage in Pakistan (Paper IV).

Paper V

Findings presented in this paper are based only on interviews of 19 pre-identified married women of reproductive age who had been married before the age of 18 years, and are therefore not generalizable to the views of all women in Pakistan. Further, participants were selected from two administrative towns with the most populous slum areas within six urban localities of Lahore city, therefore findings of women in our study may not be representative of other localities and cities of the country. Findings can be subject to recall and social desirability biases even though we tried to reduce these biases by conducting interviews either at the participants' homes when they were alone during the daytime or at the NGO workers' office to give participants a more private opportunity to report the sensitive information. Most of the participants in our study were uneducated that may have introduced a bias in the study. The health problems reported by the participants may be a direct consequence of their low socio-economic status by lacking their ability to afford the expensive healthcare or to maintain a good diet, therefore the findings need to be interpreted with caution. However, previous studies have shown the negative health outcomes among those married as children even after controlling for social vulnerabilities such as women's economic status, education, ethnicity, and place of residence [28, 58, 78].

STRENGTHS

Literature on child marriages in Pakistan is almost non-existent. The thesis comprised of studies that provide the national household level data for the first time on child marriage, and comprehensively look at the relationship of child marriage and maternal and child health in Pakistan. The breadth of the household and individual level data on social and demographic characteristics combined with the fertility and health data make the PDHSs a rich data source for epidemiological analysis [88]. PDHSs provides variety of data such as demographic, social, wealth and health (measured and self-reported), which enables us to do deeper analysis of the data, and allow us not to only estimate the prevalence of child marriage among ever-married women but characterize complex associations between child marriage and health outcomes in Pakistan.

Earlier international reports from UNICEF [1] and ICRW [2] did not include Pakistan in their reports because of low numbers of child marriages in the country as compared to some of the neighboring countries like India and Bangladesh. However, our findings (Paper II) show that the prevalence of child

marriages and its deleterious effects among ever-married women in Pakistan is substantial, rather exclusion of FANA (from PDHS, 2006-07), and FATA, and restricted military and protected areas from both PDHSs due to security reasons [36], and lack of enforcement for registration of all marriages with Nikah (marriage) Registrar in Pakistan [9] may underestimate the prevalence of child marriage in the country. Our findings provide enough evidence for the local and federal government to prompt interventions against child marriage practice in Pakistan. Our paper IV is one of the first papers in the literature that estimates the national prevalence of CB and spousal violence among women aged 15-24 who were married as children.

Using mixed method approach (quantitative and qualitative) is a particular strength of our thesis. The current thesis generates population level information on consequences of child marriage on morbidity and mortality of children in Pakistan. This study fills in the current knowledge gap, and highlights important findings associated with child marriages and poor health outcomes in Pakistan beyond those attributed to social vulnerabilities. Especially, first ever collected qualitative data on child marriage in Pakistan has augmented the quantitative data from PDHS by giving insight of knowledge and attitude about child marriage practice among women who themselves were married as children, and provides a potential to design culturally accepted interventions against child marriage practice in Pakistan. The information is helpful for local government and non-governmental sectors, and subsequently by other low- and middle-income countries in devising preventive strategies to reduce gender disparities as a consequence of child marriages.

POLICY IMPLICATIONS

Provision of Education

One of the general measures is education which is pivotal in country's development; investing in education is helpful for human development and improving the quality of life. Overall, education is a tool to provide ideas, develop, learn and adjust to changing social and cultural environment within a country and around the world. Furthermore, education helps to increase income, reduce poverty and improve health. It has been shown that doubling the proportion of girls educated at the secondary level, could reduce the fertility rate from 5.3 children per women to 3.9 after controlling for variables such as access to family planning and healthcare [89]. Further, infant mortality rate reduced by 5-10% with each additional year of a mother's schooling [89], and by increasing the secondary and higher level of schooling has a substantial beneficial effect on women's own health outcomes, and for risks of disease [89]; same holds true for use of prenatal and delivery services and postnatal care among women. Enrollment of girls in secondary school is inversely proportional to girls married before the age of 18, and it has been shown that girls with less than primary schooling are more likely to marry earlier, bear children earlier, and have more children when compared with girls who have completed primary schooling [89]. Interventions such as reducing costs of study in schools, scholarship program, building schools close to girls' residents, and making them safe and girl-friendly have proved successful in increasing girls' participation in primary and post primary school [89]. Further, providing incentives to the parents such as food and food stuffs when their girls attend school for at least 20 days a month, a program led by World Food Program has shown to increase the overall enrolment of girls in primary schools by 135% from 1998-99 to 2003-04 [90].

Employment Opportunities and Income-earning Activities

Poverty is one of the main reasons of parents for keeping girls away from the school, that indirectly prevent girls later in life to join the workforce of the country and to become independent of their own finances. Provision of employment and income-earning activities to young girls may help alleviate financial burden of the family, what poor families usually think of their girls. Provision of employment opportunities to young girls after completion of schooling may also help containing child marriage practice in the country as delaying marriage of their daughters would provide monetary gains to the family that otherwise would not, which is one of the reasons of child marriage. Further, reducing income

gaps and occupational segregation among both sexes would empower women and make them independent, which in turn would provide women with opportunities for making strategic choices and decisions, especially in family decision-making for direct concerns of their health and family's future well-being.

Implementation and Enforcement of Strict Laws Against Child Marriage Practice

Strict laws against child marriage practice with severe penalties are one of the best measures that can help eliminate child marriage practice from Pakistan. As mentioned earlier, some of the primitive cultural practices such as *Pait Likkhi*, *Addo Baddo*, and *Swara / Khoon-Baha / Vani / Sakh*, which are prohibited by country's law needs enforcement of laws to abolish these primitive practices. Engaging local communities in the process of raising awareness, building on local knowledge and generating local response can be helpful in containing these primitive practices that lead to child marriage. A success story where child marriage practice is at steep decline is in neighboring country, Sri Lanka an increase in age of marriage to 25 years, along with mandatory registration of marriage and mutual consent of bride and bridegroom helped declining the practice [4]. Further, coupling these legislative measures with free education (from primary to university level) in the country of Sri Lanka played an important role in the decline [4].

Large age gaps between the couples has been seen in child marriages, where husbands are usually many fold older than the age of brides (Paper IV) [38]. The huge age gaps between couples could lead to the imposition of more restrictions on the mobility of wives by husbands and at the same time increase the chance of wives being victims of spousal violence. The exact explanation as why parents choose to marry their girls to someone who is many fold older than the girl is unknown but the large age gap being strongly associated with child marriage practice, as shown in international report [2] emphasize the need of having strict laws to reduce spousal age gap, which when coupled with laws for increasing age of marriage in the country can have strong impact in reducing child marriage practice in Pakistan.

Improving Cultural Barriers

Our studies showed that cultural factors rather than social vulnerabilities alone are some of the reasons for poor health outcomes among women who are married as children in Pakistan. For instance, research in other countries has shown that women married as children are more likely to be controlled by husbands and in-laws [1, 2, 15], which also holds true in Pakistan [8] (Paper IV). Controlling behaviors may lead to restricted mobility and health-related decisions within the household thus leading to poor health outcomes among these young women. Further, the role of cultural factors such as men's traditional attitude towards women, the more rigid sex-role stereotypes, and the patriarchal non-egalitarian expectations directed toward those married as children in Pakistan are hypothesized as some of the reasons for poor health outcomes among these young women in the country. Therefore, designing culturally sensitive interventions are needed in the country to eliminate child marriage in Pakistan. For instance, by taking community-based participatory approach [91] where community itself along with organizational representatives gets involved in increasing the knowledge, and integrating it with interventions, policy and social change to improve civil, sexual and reproductive health rights for women in the community may help towards reducing the practice in the country.

Raising Awareness of Harmful Effects of Child Marriage Practice

Despite a quarter of participants in our qualitative study (Paper V) reported being suffered from several health problems, they seemed unaware of the negative health outcomes of child marriages. Raising awareness of the negative health outcomes of child marriage by the government, local and international NGOs through mass-media campaign is an important tool [92, 93]. Media like radio and television should be used to educate and sensitize people, especially parents about negative health outcomes of child marriage practice in the country. One of the ways is collaboration between media and public health officials and have various advertisements, stage shows and telefilms showing the harmful effects of child marriages.

Assistance of Young Girls Who are Already Married as Children

While laws are needed to eliminate child marriage practice from the country, significant supportive efforts are needed for those women who are already married as children. Since child marriage is associated with high fertility with rapid repeat births (Paper II), less likely to utilize prenatal care, and more likely to deliver babies at home (Paper I), access of quality health services, provision of family planning services, and ensuring clean delivery practices are necessary for the women already married as children. Significant psychological support is also needed for these young women who are psychologically and socially dependent on their husbands, who are many times older than girls and are abusive in nature (Paper IV).

Improvement of Birth and Marriage Registration System in Pakistan

As mentioned earlier, the current existing civil registration system of Pakistan is deficient and is below satisfactory both in terms of scope and coverage which results in lack of documentation for birth registration at the time of marriage, especially in rural areas that may indirectly contribute to the child marriage practice in Pakistan. It is therefore, essential to improve the birth and marriage registration system in Pakistan. There is also a need of raising awareness among communities the value of registering children at birth. Further, it is essential to train the birth attendants who deliver children at home regarding the requirements of birth registration and making sure to inform the families about these requirements.

Engaging Religious Leaders of Community

Varying interpretation of religion has been noticed as one of the reasons for child marriage practice in Pakistan (Paper V). It is therefore, essential to engage the religious leaders of the communities to clarify the misinformation of child marriage practice through religious teachings among their community members. Additionally, bringing together religious scholars and then explaining the communities about the deleterious effects of child marriage, and the importance of delaying marriage of girls may help reducing the practice in Pakistan.

CONCLUSIONS

Child marriage was significantly associated with decreased likelihood of any prenatal care and prenatal care by skilled medical care providers, and increased likelihood of delivery assistance by unskilled medical providers and delivery at home (Paper I). Child marriage was also significantly associated with high fertility, rapid repeat childbirth, unwanted pregnancy, and pregnancy termination (Paper II). Child marriage increased the likelihood of recent diarrhea among children born to young mothers (Paper III). Even though maternal child marriage was associated with infant mortality and mortality of children under 5 years of age in unadjusted models, association was lost in the adjusted models (Paper III). Further, child marriage was significantly associated with CB and spousal violence by husbands compared to adult marriage (Paper IV). Socio-cultural factors seem to be important determinants of the negative health outcomes of child marriage practice in Pakistan. Despite a sizable proportion of participants reported being suffered from several health problems, they seemed unaware of the negative health outcomes of child marriages (Paper V). Rather they were satisfied with the decision of their parents of marrying them before the age of 18 years, and even condemned banning child marriages in the country (Paper V). Strong influence of culture and community perceptions, varying interpretation of religion, and protecting family honor are some of the factors that were narrated by the participants that play a role in continuation of child marriage practice in the country (Paper V).

Pakistan has made enormous strides of reducing child marriage in the face of current incredible political difficulty. There is a need for continued support and focus on the women and children of Pakistan as recent worsening of the political situation may very well result in backslide of progress that has already been made in eliminating child marriage and its associated worst health outcomes without the international support. Interventions such as implementation and enforcement of strict laws prohibiting

the practice, empowering women by increasing education, promoting civil, sexual and reproductive health rights, creating job opportunities, and enhancing women role in family decision-making can help in tackling child marriage practice. Significant efforts are needed locally and at governmental level to abolish these traditional cultural practices, which can directly reduce the high numbers of child marriages in Pakistan. Efforts to increase the age of marriage and delayed childbearing may have population level effect in reducing disparities between women married as children and adults, and improving maternal and child health in Pakistan.

FUTURE RESEARCH

Our thesis estimate the prevalence and negative health consequences of child marriage practice among married women in Pakistan. However, because of lack of data we were not able to assess some of the consequences such as risk of HIV/AIDS and sexually transmitted infections among women married as children, especially those who have abusive husbands. It is possible that abusive partners are more likely to engage in risky HIV behaviors, such as having multiple sex partners [94, 95]. Alternatively, violent HIV-infected partners may directly transmit HIV to their partner via unprotected coercive sex [94, 96]. Further, limited or compromised negotiation of safer sex practices, such as condom use, may be more likely in violent, controlling relationships, and this would place their partner at increased risk of HIV acquisition [97, 98]. Nonetheless, the prevalence of HIV is unknown among women married as children, and whether by which mechanism HIV is transmitted to these young women warrants further investigation. An international study have also shown that women married as children are more likely to suffer sexual violence as compared to those married as adults [99]. However, due to lack of data in the PDHS we were not able to assess the prevalence of sexual spousal violence among women married as children in Pakistan that needs further research.

High prevalence of spousal violence among women married as children as compared to those married as adult may lead to psychological morbidities, and even depression and suicide in these young women. However, there is no data to-date about the psychological impact of child marriage practice, and whether child marriage is associated with depression and suicide. Therefore, more research in this area would advance our knowledge on this subject.

Factors such as income-earning activities, higher education, smaller age gap between a women and her partner, which indicates a higher status level for women in a society are found protective of child marriage in earlier reports, however lack rigorous evaluation to determine whether these factors really work to prevent child marriage [1, 2, 5, 59]. There is a need for not only to design, and implement strategies to reduce child marriage practice but also needs more research and evaluation of those factors that have shown to reduce child marriage practice in other countries.

Local NGOs, like The ActionAid Pakistan, and Plan International that are active in raising voices against child marriage practice in Pakistan [100, 101] should join hands with researchers to best utilize the research results, and to investigate which approach is the most effective to eliminate child marriage practice. Lastly, we are not aware of any longitudinal study that has assessed the impact of child marriage on maternal and child health, it is necessary to conduct longitudinal studies to determine the “cause and effect” relationship of the consequences of child marriages on maternal and child health.

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APPENDICES

Sampling Frame and Design

1. Pakistan Demographic Health Survey, 2006-07

A nationally representative household-based sample was obtained by a two-stage, stratified, random sample design excluding the Federally Administrative Northern Areas (FANA) (now known as Gilgit-Baltistan region), Federally Administrative Tribal Areas (FATA), and restricted military and protected areas due to security and political reasons. Urban areas were classified into large cities (capital cities and cities with over 1 million population), small cities (population 50,000- 1 million), and towns (population < 50,000), while all rural areas were assumed to be countryside. Large sized cities, Sargodha, Bahawalpur, Hyderabad, Sukkur, Peshawar, Quetta, and Islamabad constituted one stratum which was further sub-stratified as low-, middle- and high-income groups. After excluding large cities, all small cities and towns from the four provinces of Pakistan were grouped to form another stratum. Rural areas from three of four provinces (Punjab, Sindh, and NWFP) were grouped to form independent stratum, while fourth province of Balochistan was treated as a separate stratum.

Using a two-stage, stratified, random sample design, the first stage involved selecting clusters (1,000 sample points) with probability proportional to size i.e. 390 in urban areas and 610 in rural areas. The smaller provinces (e.g., Balochistan and NWFP) as well as urban areas were over-sampled. A total of 440 sample points were selected in Punjab, 260 in Sindh, 180 in NWFP, 100 in Balochistan, and 20 in FATA. In urban areas, the sample points were selected from a frame including households maintained by the Federal Bureau of Statistics, consisting of 26,800 enumeration blocks, each including about 200-250 households. The frame for rural areas consisted of the list of 50,558 villages enumerated in the 1998 population census. Twenty clusters from FATA, four clusters from Balochistan, and another four clusters from NWFP could not be included in the survey design because of security, lack of provision of household listing from Federal Bureau of Statistics, and refusal of the community respectively.

In both urban and rural areas, households were selected in second stage by systematic random sampling technique. A total of 10,601 ever-married women aged 12-49 years from the 9,255 households were approached, of whom 10,023 were successfully interviewed, yielding a response rate of 95 percent. Because there were only three ever-married women under age 15 (all of whom were 14), they were all made to be age 15. Thus PDHS provides detailed information on 10,023 ever-married women aged 15-49 years. For more details please refer to full report by National Institute of Population Studies, Islamabad, Pakistan and Macro International (now called as ICF International), Calverton, Maryland, USA [36].

2. Pakistan Demographic Health Survey, 2012-13

A nationally representative household-based sample was obtained by a two-stage, stratified, random sample design excluding the FATA, and restricted military and protected areas due to security and political reasons.The sample for the 2012-13 PDHS represents the population of Pakistan excluding Azad Jammu and Kashmir, FATA, and restricted military and protected areas. The universe consists of all urban and rural areas of the four provinces of Pakistan and Gilgit Baltistan, defined as such in the 1998 Population Census. PBS developed the urban area frame. All urban cities and towns are divided into mutually exclusive, small areas, known as enumeration blocks, that were identifiable with maps. Each enumeration block consists of about 200 to 250 households on average, and blocks are further grouped into low-, middle-, and high-income categories. The urban area sampling frame consists of 26,543 enumeration blocks, updated through the economic census conducted in 2003. In rural areas, lists of villages/mouzas/dehs developed through the 1998 population census were used as the sample frame.

In this frame, each village/mouza/deh is identifiable by its name. In Balochistan, Islamabad, and Gilgit Baltistan, urban areas were oversampled and proportions were adjusted by applying sampling weights during the analysis. A sample size of 14,000 households was estimated to provide reasonable precision for the survey indicators. NIPS trained 43 PBS staff members to obtain fresh listings from 248 urban and 252 rural survey sample areas across the country. The household listing was carried out from August to December 2012.

The second stage of sampling involved selecting households. At each sampling point, 28 households were selected by applying a systematic sampling technique with a random start. This resulted in 14,000 households being selected (6,944 in urban areas and 7,056 in rural areas). The survey was carried out in a total of 498 areas. Two areas of Balochistan province (Punjgur and Dera Bugti) were dropped because of their deteriorating law and order situations. Overall, 24 areas (mostly in Balochistan) were replaced, mainly because of their adverse law and order situation. For more details please refer to full report by National Institute of Population Studies, Islamabad, Pakistan and ICF International, Calverton, Maryland, USA [57].

Institutional Review Board Approval Letter from University of the Punjab, Lahore, Pakistan

Office of the Dean
Faculty of Behavioral & Social Sciences
University of the Punjab, Lahore-Pakistan

Ref: No. D/ 688 /FBSS

Date: _____ 2012

D/ 688 dated 25-4-2013
Faculty of Behavioral & Social Sciences
University of the Punjab, Lahore.

25.04.2013

Subject: - **Approval of the Research Plan**

The research plan *"Understanding the Impact of Early Marriages on Lives of Women Married as Children - A Qualitative Study in a Sample of Married Women of Reproductive Age in Pakistan"* by Mr. Muazzam Nasrullah, Rubeena Zakar and Alexander Kraemer was reviewed by the Institutional Review Board (IRB) in its meeting held on 8th January, 2013. The members of the IRB thoroughly reviewed the methodology specifically ethical dimensions of the research plan. After thorough deliberations, the IRB unanimously approved the said research.

Prof. Dr. Muhammad Zakria Zakar
Chairman (IRB)

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Consent Form

Study Title: Child Marriage and its Impact on Maternal and Child Health in Pakistan

I have been fully explained the purpose of this study and the reasons why I am interviewed. I have had the opportunity to ask questions about it and am fully satisfied with the responses. I hereby give my consent voluntarily to be a participant in this study.

Name of Participant_____ Signature of Participant _____

Date _____

Day/month/year

Name of Interviewer _____Signature of Interviewer _____

Date _____

Day/month/year

In-depth Interview Guide for Qualitative Study

Child Marriage and Its Impact on Maternal and Child Health in Pakistan

PART A

Name: _____ Respondent No.: _____

Contact no.: _____ City: _____

Town: _____ Area type: Rural, Urban

Union Council: _____ Code: 1, 2

Address: _____

Date: _____

Respondent's age: _____ Education: _____ Occupation: _____

Husband's age: _____ Husband's education: _____ Husband's occupation: _____

PART B

(Reasons and attitude towards child marriage)

1. Why were you married before the age of 18 years?
   (NOTE: probe for either poverty, Dowry, Protecting honor, traditional practices such as *WattaSatta* (bartering bride for bride), *PaitLikkhi* (marrying children before they are born or are still very young), *AddoBaddo* (marriage among tribes), and *Swara / Khoon-Baha / Vani / Sakh* (girls given in marriage as a form of dispute resolution)
2. Are you aware of the negative health outcomes of child marriage? If yes, what are these?
3. Do you feel satisfied today that you were married before 18 years? If yes, why?
4. In your opinion marriage before 18 years should be continued in the country?
5. If you have a girl, do you intend to marry her before 18 years of age?
6. Do you think that marriage before 18 years should be stopped in the country? If yes how?

PART C

(Fertility outcomes)

1. How many children do you have now?
2. Did you have any child birth within first year of marriage?
3. Did you have at least two child births that were less than 24 months apart?
4. Did you have complications during pregnancy? If yes what were those?
5. Did you have complications during delivery, If yes what were those?
   (NOTE: pay special attention to premature labor and obstructed labor)
6. Did you encounter involuntary urine flow or feces after you have had long labor at the time of delivery? (NOTE: getting to know about obstetric fistula—common during obstructed labor among young mothers)
7. Do you ever have unwanted pregnancy?
8. If yes, what did you do after you have had unwanted pregnancy?
9. Have you ever terminated your pregnancy? If yes, did it lead to any complication during or after termination?
10. Do you believe that your partner wants more children than you want yourself? If yes, who decides how many children you want in your family?
11. Do you feel that you or your partner's desire for son lead you to have more children than you desire otherwise?
12. Have you or your husband ever used any method to not get pregnant after marriage?
13. Does your partner support your idea of using methods to not get pregnant?

PART D

(Prenatal/Antenatal, Postnatal care)

1. While pregnant, did you receive prenatal care?
2. If not, what was the reason for you to not receive prenatal care? (Probe if it is due to long distance they have to travel to health facility) (SKIP TO QUESTION 12)
3. If yes, the prenatal care was received by a doctor, nurse, midwife or lady health visitor?
4. If yes, the prenatal care was received by a traditional birth attendant/ *Dai*, Homeopath, Hakim or Dispenser?
5. Where did you receive your prenatal care when pregnant? (If home, SKIP TO QUESTION 10)
6. How many times you visited healthcare provider for prenatal care?
7. How far is the healthcare provider from your home?
8. How do you reach the healthcare provider, for instance by walk, motorcycle, car, taxi, bus?

9. Were you satisfied with the care by health care provider during pregnancy?
10. What was the reason for you to receive prenatal care?
11. Were you satisfied with your prenatal care?
12. Where did you deliver your baby?
13. Who deliver your baby?
14. Was there any complication during the pregnancy or delivery?
15. How long did you stay at the healthcare provider clinic after delivery? (ONLY IF DELIVERED IN HEALTHCARE CARE FACILITY)
16. Were you forced by your husband or in-laws to deliver at home?
17. Who decided at your home where you should receive prenatal care, and deliver your baby?
18. Do you think that antenatal and postnatal care should be improved in the country? If yes how?

PART E

(Under-five morbidity and mortality of children)

1. How many of your children died?
   If NOT SKIP TO QUESTION 3
2. If yes, at what ages? (NOTE: If respondent could not recall, please ask if the children died before first month of birth, first year of birth, before the fifth year of birth)
3. Among those children who are alive how many were very small or smaller than average at birth?
4. Among those children who are alive how many were wasted or weak than average at birth?
5. Among those children who are alive how many had diarrhea, pneumonia or both for 2 weeks or more just after birth?
6. Among those children who are alive how many had difficulty in breathing just after birth?
7. Was there any complication just after the birth of child? If yes, what were these?
8. Did you breastfeed your children after birth? If yes, for how long?
9. Do you feel you could have prevented the death or diarrhea or pneumonia or difficulty in breathing of your child/children after birth?
10. In your opinion, how death of a child or diarrhea or pneumonia or difficulty in breathing just after birth can be stopped in the country?
11. What you would have done differently to stop the death, diarrhea, pneumonia or difficulty in breathing of your child? (PROBE: if she blames her **younger age of marriage** to these conditions)
12. Were you able to take your sick child to nearest hospital/dispensary at that time?
13. How far is hospital/healthcare provider from your place?
14. Were you allowed to take your sick child to hospital without the permission of your partner or in-laws?

15. Who decides how to spend earnings at home, decisions about health care, major household purchases, daily household needs, and visits to your family or relatives?

PART F

(Violence)

Types of violence and circumstances leading to particular type of violence

1. Has an intimate partner ever **THREATENED** you with physical violence? This includes threatening to hit, slap, push, kick, or physically hurt you in anyway. If yes, what were the circumstances leading to such violence?
2. Has an intimate partner ever **ATTEMPTED** physical violence against you: This includes times when they tried to hit, slap, push, kick, or otherwise hurt you, **but they were not able to**. If yes, what were the circumstances leading to such violence?
3. Has an intimate partner ever hit, slapped, pushed, kicked, or hurt you in any way? If yes, what were the circumstances leading to such violence?
4. Have you ever experienced any unwanted sex by a current or former intimate partner? If yes, what were the circumstances leading to such violence?
5. Has your current or former partner ever humiliated insulted, yelled at you in front of others? (PROBE: if he ever humiliated her for bringing insufficient dowry, poor household management skills or poor training of children)
6. Has your current or former partner ever restricted information or restricted your movements or isolated you socially?

Suggestions to contain violence against women

1. In your opinion, how violence from partner can be stopped? (PROBE: Role of men, male family members, family women, in-laws, community person)
2. Do you know any institution in the country that can help? If yes, how? (PROBE: police, court, NGO, media)