

# Relationship Between Child Marriage with Reproductive Health and Cervical Neoplasia in Karnali, Nepal

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## ABSTRACT



**Background:** Child marriage (marital age less than 18 years) is recognized as a violation of human rights. However, it remains a deep-rooted social problem in Nepal. We aimed to find out the relationship between child marriage and reproductive health and cervical neoplasia.

**Methods:** A cross-sectional study was conducted from March 2016 to January 2017 in the Jumla district of Karnali province, Nepal. Apparently healthy, married women ages 20–65 were invited to participate in a cervical screening awareness program followed by an interview and examination. Interviews to obtain sociodemographic and reproductive health information were followed by cervical cancer screening by cytology and visual tests.

**Results:** Out of 2190 eligible participants, 1450 (66%) reported child marriage. Illiteracy, smoking, multiparity, number of living children, and abortion rates were all significantly higher among the women who had a marital age of less than 18. Reports of abnormal cytology, visual inspection with acetic acid, and Lugol's iodine were not significantly different among the two groups of women who married before or after the age of 18.

**Conclusions:** Child marriage is highly prevalent in Jumla, Karnali of Nepal and is associated with poor reproductive health outcomes, but is not significantly associated with an increase in cervical neoplasia as judged by visual inspection or cytology. It is highly recommended that child marriage in Nepal be prevented by improving awareness of the risks of child marriage, education, socioeconomic status, and strict implementation of the existing marriage age law.

**Keywords:** Cervical neoplasia, child, marriage, reproductive health

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## INTRODUCTION

Child marriage (marriage less than the age of 18 years) is a global concern, recognized as a violation of human rights.<sup>1</sup> Globally, in 2017, about 100 million girls were married before the age of 18.<sup>2</sup> Child marriage is a major contributing factor to adolescent pregnancy. Approximately two million girls that become pregnant every year in the world were under the age of 15, and 16 million girls between the ages of 15 and 19. Birth rates for 15-19-year-olds are still four times higher in the poorest regions of the world than in the high-income regions.<sup>1</sup> In South Asia, the adolescent birth rate is 47 percent.<sup>3</sup> Ninety percent of adolescent girl gives birth within the first year of their marriage. Generally, they have no options or decision making role in childbearing.<sup>1</sup> In all countries and regions, women of low socio-economic backgrounds and low educational status are more likely to become adolescent mothers.<sup>4</sup>

In Nepal, the legal minimum age for marriage is 20 years.<sup>5</sup> But child marriage is common in Nepal and sexual debut happens almost exclusively within the marriage in the case of female adolescents. Although some progress has been observed in reducing the prevalence of child marriage, it remains a deep-rooted social problem in Nepal.<sup>6</sup> A study done in a rural community hospital in Nepal reported that there were more than 29% adolescents birth<sup>7</sup>. Implementation of the existing law seems ineffective.

Child marriage is common in Mid-Western Hill and Central Terai regions of Nepal. This is particularly the case among poorly educated, low-income households in certain indigenous ethnic communities.<sup>8</sup> Child marriage and a resultant early sexual debut can lead to adverse reproductive health outcomes such as abortions, multiple pregnancies, exposure to sexually transmitted infections (STIs), HIV infection, and cervical cancer.<sup>9,10</sup> Child marriage has a poor effect on the utilization of maternal

health care which causes low usage of antenatal care, facility-based delivery, and post-natal care. Moreover, they have more school drop-out rates than their unmarried peer.<sup>11</sup> The Karnali province has one of the highest rates of child marriage and the women in this region has lower literacy (41%) rate in comparison to women's national literacy rate (57.4%).<sup>12</sup> There is a lack of data in this area to describe the consequences of child marriage from a reproductive health perspective. The objective of this study was to describe: 1) the reproductive health status of the women living in a rural area of Nepal and 2) the association between child marriage and reproductive health outcomes and cervical neoplasia.

## MATERIALS AND METHODS

A cross-sectional study was conducted from March 2016 to January 2017 in the Jumla district of the Karnali province, Nepal. Ethical clearance was obtained from the Nepal Health Research Council. Jumla, one of the most remote districts of Nepal, has a total population of 108,921 of which 54,023 are female. About 10% of the women of Jumla were recruited from approximately 21,400 eligible women.<sup>12</sup> Participants were selected using a convenience sampling technique during a mobile cervical cancer screening program.

The study had three phases: an awareness campaign, interview, and examination. The awareness program used pamphlets and lectures to increase women's knowledge regarding child marriage, reproductive health, and cervical cancer. Educational content regarding cervical cancer included risk factors (such as early marriage, multiparity, multiple sexual partners) and the importance of screening. Women were openly invited for opportunistic cervical cancer screening through radio, newspapers, and local health workers.

Apparently healthy married women aged 20-65, and with no history of cervical cancer were included. Women were excluded if they were

pregnant, had a known psychiatric disorder, or wished to withdraw from the study. Out of total 2,279 women, written informed consent was taken from the eligible women (n=2,190). Women who did not meet the inclusion and exclusion criteria were excluded (n=89).

The confidential interview was conducted in a separate room. Using a structured questionnaire, the participant was asked about socio-demographic and reproductive health information such as age, marital age, education, history of smoking, number of pregnancies, number of living children, abortion, number of marriages or sexual partners of the participant and/or her husband, history of use of oral contraceptive pills, history of sexually transmitted infections including HIV, and gynecological symptoms (foul-smelling per vaginal discharge, vaginal bleeding). The examination, which followed the interview, included body mass index (BMI), visual tests- Visual Inspection with Acetic Acid (VIA) and Visual Inspection with Lugol's Iodine (VILI), and cytology.

Bias was minimized as much as possible throughout the study. The research protocol was developed after extensive interaction among the research team and experts. A pilot study was followed by periodic training of the research team, including research assistants to maintain uniformity and to minimize bias. The interview and examination took place in different rooms so the examiner was blinded as to the marital status of the participants. All procedures were performed by trained research assistants under the supervision of the researcher. Visual tests and cytology for cervical neoplasia were performed as described previously.<sup>13</sup> The pathologist was blinded with the sociodemographic information and VIA and VILI report.

Cytology reports were divided into abnormal and normal. Normal cervical cytology reports included negative for intraepithelial lesion or

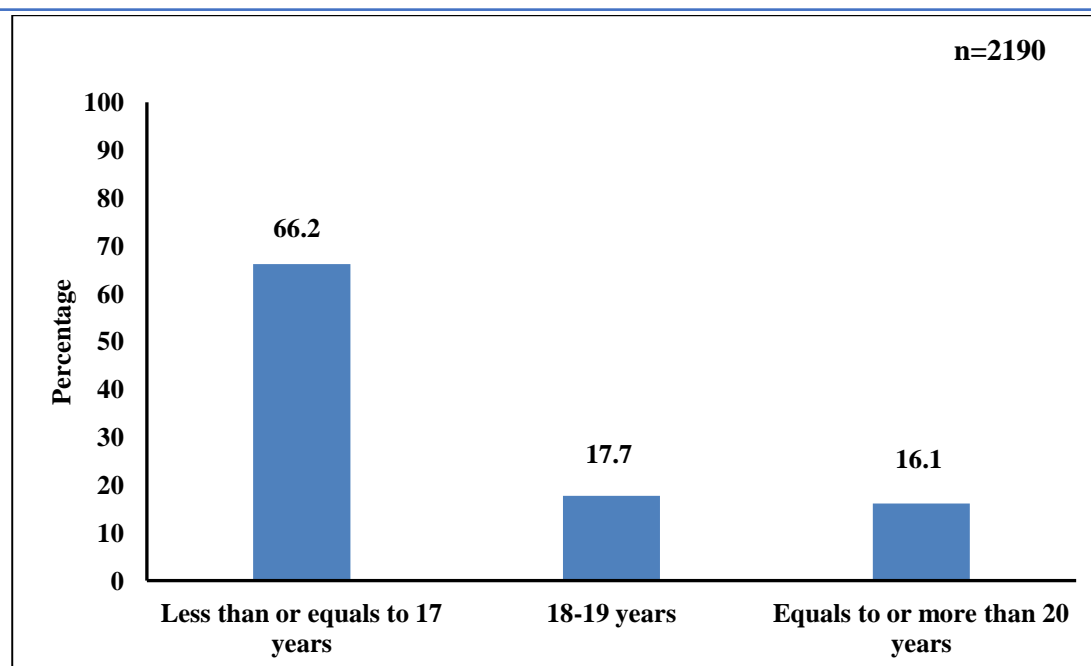
malignancy (NILM) and inflammatory changes and other endometrial shedding. Abnormal cervical cytology included: squamous cells of undetermined significance (ASC-US), low-grade squamous intraepithelial lesions (LSIL), high-grade squamous intraepithelial lesions (HSIL), and squamous cell carcinoma (SCC).

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS version 16.0). Sociodemographic and reproductive health characteristics of participants are presented as frequency and percentages. Two groups were formed for analysis based on the marital age: 1) women having marital age of 17 or less and 2) women having marital age of 18 or above. The association of child marriage with reproductive health outcomes (such as number of pregnancies, number of the living children, abortion, sexually transmitted infections, foul-smelling per vaginal discharge, contraceptive use), and positive visual tests (VIA and VILI) and abnormal cytology for cervical neoplasia were analysed using bivariate analysis (chi square test) at 95% Confidence intervals (CI) with *p*-value less than 0.05 being considered statistically significant.

## RESULTS

Of the total sample (n=2,190), 1,450 (66%) reported child marriage (under age 18), 388 (17.7%) married between 18 and 19 years of age, and 352 (16.1%) married after the age of 20 (the minimum legal age for marriage in Nepal) (Figure 1).

Table 1 shows the characteristics of the participants in relation to marital age. Rates of illiteracy ( $p<0.001$ ) and smoking ( $p=0.016$ ) were significantly higher among the women with marital age 17 or less. Women who married after 18, and their husbands, were less likely to have multiple marriages.



**Figure 1.** Distribution of participants according to marital age.

**Table 1.** Characteristics of the participants in relation to marital age.

Characteristics	Total n (%)	Marital Age (Years)		p- value*	OR (95%-CI)
		≤ 17	≥ 18		
Age					
≥ 31	1059 (48.4)	682 (47.0)	377 (50.9)	0.083	0.85 (0.71-1.02)
≤ 30	1131 (51.6)	768 (53.0)	363 (49.1)		
Education					
Illiterate	1610 (73.6)	1132 (78.2)	478 (64.6)	0.000	1.96 (1.61-2.38)
Literate	578 (26.4)	316 (21.8)	262 (35.4)		
Smoking					
Smoker	398 (18.2)	284 (19.6)	114 (15.4)	0.016	1.38 (1.05-1.69)
Non-smoker	1792 (81.8)	1166 (80.4)	626 (84.6)		
Participant's multiple marriages					
Present	126 (5.8)	75 (5.2)	51 (6.9)	0.102	0.74 (0.51-1.06)
Absent	2064 (94.2)	1375 (94.8)	689 (93.1)		
Husband's multiple marriages					
Present	241 (11.0)	158 (10.9)	83 (11.2)	0.821	0.97 (0.73-1.28)
Absent	1949 (89.0)	1292 (89.1)	657 (88.8)		
Body mass index (kg/m2)					
< 18.5	364 (16.6)	254 (17.5)	110 (14.9)	0.113	1.22 (0.95-1.55)
> 18.5	1825 (83.4)	1195 (82.5)	630 (85.1)		

\* Chi-square test; OR- Odds Ratio

Table 2 illustrates the reproductive outcomes of the participants with marital age. The number of pregnancies (more than or equals to three,  $p < 0.001$ ) and living children (more than or equals to three,  $p = 0.001$ ) were

significantly higher among the women whose marital age was less than or equal to 17. Statistically not significant but number of abortion ( $p = 0.05$ ), sexually transmitted infection ( $p = 0.70$ ), and foul-smelling per

vaginal discharge ( $p=0.13$ ) were more prevalent among the women who married young. There was no significant difference in contraceptive use among the women of two groups.

Abnormal cytology reports, VIA, and VILI reports were not significantly different among the two groups of women (Table 3).

**Table 2.** Reproductive health outcomes of the participants in relation to marital age.

Characteristics	Total n (%)	Marital Age (Years)		p- value*	OR (95%-CI)
		≤ 17	≥ 18		
Number of Pregnancy					
> 3	1510 (68.9)	1045 (72.1)	465 (62.8)	0.000	1.53 (1.26-1.84)
< 2	680 (31.1)	405 (27.9)	275 (37.2)		
Number of living child					
> 3	1062 (48.5)	739 (51.0)	323 (43.6)	0.001	1.34 (1.12-1.60)
< 2	1128 (51.5)	711 (49.0)	417 (56.4)		
Number of abortions					
≥ 2	560 (25.6)	389 (26.9)	171 (23.1)	0.057	1.22 (0.99-1.50)
0 or 1	1628 (74.4)	1059 (73.1)	569 (76.9)		
<b>Sexually Transmitted Infection</b>					
Yes	314 (14.4)	211 (14.6)	103 (14.0)	0.707	1.05 (0.81-1.35)
No	1874 (85.6)	1239 (85.4)	635 (86.0)		
<b>Per vaginal discharge (Foul smelling)</b>					
Present	1359 (62.1)	916 (63.2)	443 (59.9)	0.131	1.15 (0.95-1.37)
Absent	831 (37.9)	534 (36.8)	297 (40.1)		
<b>Contraceptives use</b>					
Users	249 (11.4)	165 (11.4)	84 (11.4)	0.984	1.00 (0.75-1.32)
Non-users	1941 (88.6)	1285 (88.6)	656 (88.6)		

\* Chi-square test; OR- Odds Ratio

**Table 3.** Cytology and visual test reports in relation to marital age.

Characteristics	Total n (%)	Marital Age (Years)		p-value	OR (95%-CI)
		≤ 17	≥ 18		
<b>Cytology (n=2113)</b>					
Abnormal	78 (3.7)	46 (3.4)	32 (4.3)	0.290	0.78 (0.49-1.23)
Normal	2035 (96.3)	1319 (96.6)	716 (95.7)		
<b>VIA** (n=2143)</b>					
Positive	267 (12.5)	174 (12.3)	93 (12.7)	0.777	0.96 (0.73-1.25)
Negative	1876 (87.5)	1239 (87.7)	637 (87.3)		
<b>VILI† (n=2143)</b>					
Positive	362 (16.9)	232 (16.4)	130 (17.8)	0.416	0.91 (0.71-1.14)
Negative	1781 (83.1)	1181 (83.6)	600 (82.2)		

\* Chi-square test; OR- Odds Ratio; \*\* Visual Inspection with Acetic Acid; † Visual Inspection with Lugol's Iodine

## DISCUSSION



This study found that child marriage is not only highly prevalent in Jumla but women who experience child marriage have a significantly high frequency of pregnancies, living children, and multiple marriages. Moreover, they are more likely to have a partner with multiple marriages and poorer reproductive health outcomes. However, cervical neoplasia was not significantly associated with child marriage as judged by visual inspection or cytology.

Consistent with the previous report by Guragai et al. in 2017, child marriage is deeply rooted in socio-economically poor region.<sup>8</sup> This study was conducted in mountainous district of Karnali province in Nepal. This region is recognized for deprived health care facilities, transportation, and economic development in comparison to the rest of the country. More than 50% of people in Jumla live below the poverty line and the human development index (HDI) is 0.409.<sup>14</sup> Therefore, factors contributing to child marriage might be due to poverty, illiteracy, lack of awareness, and ineffective implementation of the existing law. In addition, it is difficult to track statistics on births, marriages, deaths due to a lack of an effective recording system though these kinds of registrations are mandatory. Child marriage without registration occurs due to familial and social ignorance towards existing marriage law.

Nationally, the proportion of currently married women aged 15-19 decreased from 43% in 1996 to 29% in 2011, which indicates the progress in reducing the prevalence of child marriage. However, child marriage is still a major problem in rural Nepal.<sup>6</sup> Birth rates among adolescents are much higher in the poorest regions of the world than in the high-income regions.<sup>1</sup> Adolescent women of low socioeconomic background and educational status are more at risk for child

marriage and pregnancy in all countries of South Asia.<sup>4</sup> Several papers on child marriage have reported negative reproductive health outcomes, including teenage or unwanted pregnancy, abortions, multiple pregnancies, exposure to sexually transmitted infections (STIs) and HIV infection.<sup>9</sup>

Young women in South Asia, who marry early are also at higher risk for complications of pregnancy. A study in India found that adolescent girls aged 15 to 19 were twice as likely, and adolescent girls <15 years old were five times more likely to die during childbirth than women in their twenties. Similarly, a study in Nepal reported the risk of stillbirth among adolescent girls was about 50% higher than that for women aged 20 to 29 years.<sup>15</sup> Other serious risks of pregnancy at an early age include preterm delivery, low birth weight, intrauterine growth restriction, eclampsia and pre-eclampsia, and maternal and perinatal mortality.<sup>16</sup> A systemic review was done by Amanda et al. to identify the high-quality interventions to prevent child marriage in low and middle-income countries, which has found that the majority of the interventions such as 'conditional cash transfer', 'life-skills curriculum', and 'school support' had a positive impact on child marriage.<sup>17</sup> The Karnali province of Nepal has recently implemented a 'conditional cash transfer' strategy to prevent child marriage. The evaluation of this program is yet to come. Studies have suggested that incentive-based interventions and/or educational programs alone are effective in reducing adolescent pregnancies.<sup>18,19</sup>

In contrast to a study by Louie et al., we found that early marriage and early sexual debut were not associated with cervical neoplasia.<sup>10</sup> Nevertheless, women of Jumla are at particular risk for cervical cancer due to a high prevalence of influencing factors such as illiteracy, early marriage, early pregnancy,

high parity, and smoking.<sup>20</sup> In addition, the tradition of '*chhaupadi*' forces menstruating women to stay in a separate house or animal shed with very poor personal hygiene and without a nutritious diet which can also play for poor reproductive health and ultimately cervical neoplasia.<sup>21</sup> There may be several reasons for the apparent absence of association between child marriage with cervical neoplasia. It could be due to the age factor of the participants; a large portion of the participants was age 20-30 years which is not the peak time for cancer incidence. Another reason could be the limitations of the screening tests; cytology, and visual tests have a certain limitation of sensitivity and specificity. Moreover, not only child marriage, but other multiple co-factors may have a complex role in development of the cancer. Though this was a cross-sectional study, only volunteer eligible women participated and detailed analyses were not done for other confounding factors. In addition, detailed reproductive health outcomes such as antenatal, intra-natal, postnatal were not obtained and selection bias could be present. Some recall and verification bias may also have occurred, as participants were asked to recall their marital age and reproductive health outcomes. The limitation of sensitivity and specificity of VIA, VILI, and cytology for

cervical cancer screening have been accepted. In light of the study design and use of visual tests and cytology, it was not feasible to assess for a causal relationship between child marriage and cervical neoplasia.

## CONCLUSION

Child marriage is a serious public health issue in the Jumla, Nepal. Teenage girls who marry early, as well as their families and communities, face huge challenges including poor social and reproductive health outcomes. By investing in the education of young girls and preventing child marriage and early pregnancy, women will have increased opportunities to achieve prosperity and a healthier life, and become assets to their family, society, and nation.

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