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- 16 Teenage pregnancy and the sociodemographic attributes as a major contributor: Findings from an urban referral center in Nepal

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## Clinical and Translational Research

# Teenage pregnancy and the sociodemographic attributes as a major contributor: Findings from an urban referral center in Nepal

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## Abstract

### BACKGROUND

Teenage pregnancy is a challenging issue worldwide. Yet, despite the increased health risk and socioeconomic impact of teenage pregnancy, the numbers remain high in Nepal.

### AIM

To determine the prevalence and sociodemographic factors associated with teenage pregnancy in Nepal.

### METHODS

A hospital-based cross-sectional study was conducted in the Paropakar Maternity and Women's Hospital from April to August 2017. A total of 1359 mothers were assessed and interviewed regarding their reproductive history and sociodemographic attributes. Ethical approval from the Nepal Health Research Council, permission from the concerned hospital, and consent from study subjects were obtained.

authors have nothing to disclose.

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## RESULTS

Of the 5526 deliveries, 679 (12.3%) were teenage pregnancy deliveries. The majority (85.1%) of mothers (out of 1359) were married at < 20 years of age, with a mean age of marriage of 17.57 years ( $\pm 1.994$ , range: 12-25 years). Marriage age was a significant determinant of teenage pregnancy (odds ratio [OR] 2.423 [2.262-2.596];  $P < 0.001$ ). Likewise, a love marriage (OR: 2.018 [1.585-2.570];  $P < 0.001$ ) and first teenage pregnancy (OR: 3.622 [3.265-4.017];  $P < 0.001$ ) were significant determinants for subsequent teen pregnancies. Knowledge of family planning methods (OR: 0.474; 0.288-0.779;  $P = 0.003$ ) and use of any methods of family planning utilization (OR: 0.345; 0.248-0.479;  $P = 0.000$ ) significantly lowered the chance of teenage pregnancy.

## CONCLUSION

Teenage pregnancy occupies a substantial proportion of total deliveries in the Nepalese maternity hospital. In addition, early pregnancy was significantly associated with age and type of marriage, education level, knowledge, and practice of contraceptive methods.

**Key Words:** Contraception; Nepal; Reproductive health; Teenage pregnancy; Marriage; Education

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**Core Tip:** This study evaluated the prevalence and sociodemographic factors associated with teenage pregnancy in Nepal. Teenage pregnancy carries a significant proportion of total deliveries in a Nepalese maternity hospital. Early pregnancy was significantly associated with age at marriage, education level, type of marriage, and contraceptive practice.

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## INTRODUCTION

The United Nations Children's Fund defines teenage pregnancy as pregnancy in a girl aged 13-19 years[1]. This usually refers to pregnant girls who have not reached legal adulthood, which varies worldwide. Approximately 21 million girls aged 15 to 19 years and 2 million girls under 15-years-old become pregnant in developing regions every year[2]. About 16 million girls aged 15-19 years and 2.5 million girls under age 16 give birth in developing regions[3]. In South Asia, the early marriage of adolescents is common, and 25%-35% of adolescent girls in Pakistan, Bangladesh, India, and Nepal begin childbearing as early as 17 years[4]. About 90% of births to adolescents occur within marriage in developing countries, mainly due to customs and traditions and lack of education and information about reproductive and sexual health[5,6]. Various socioeconomic problems such as school dropout and unemployment and psychological issues such as depression are also common among teenage pregnancy[7,8]. In addition, multiple factors including rural residence, not attending school, low educational status of parents and lack of communication between teenagers and parents on sexual and reproductive health issues, and lack of knowledge about contraceptive methods are associated with teenage pregnancy[9].

Teenage pregnancy is a challenging issue for families and adolescent parents. It is associated with higher rates of morbidity and mortality for both the mother and infant. Teenage pregnancy is associated with an increased risk of neonatal complications like prematurity, low birth weight, intrauterine growth restriction, neonatal mortality, and stillbirth[5,6,10]. Maternal complications such as pregnancy-induced hypertension, preeclampsia, malnutrition and anemia in pregnancy, perineal tear, episiotomy, and

cesarean delivery are also common among teenagers[11,12]. Risks for medical complications are more significant for girls  $\leq 14$  years of age, as an underdeveloped pelvis can lead to difficulties in childbirth[13]. In Nepal, where marriage is universal and occurs at young ages, early teenage pregnancy is of prime public health importance. This study was conducted to determine the burden of teenage pregnancy in an urban referral maternity hospital of Nepal and to analyze sociodemographic factors as determinants.

## MATERIALS AND METHODS

### *Study setting and population*

A hospital-based cross-sectional study was carried out from April to August 2017 to determine the proportion of teenage deliveries and factors associated with early pregnancy. Study samples were selected from the Paropakar Maternity and Women's Hospital, a tertiary level referral maternity hospital in Nepal and the only semi-government hospital providing maternity services to the general public. Mothers who attended the study hospital for the delivery during the study period were interviewed, and data on sociodemographic characteristics, reproductive history, and social behaviors were collected.

Cases consisted of all teenage women who came to the hospital for delivery. They were interviewed during the prenatal period and 1 or 2 d postpartum depending on the mother's level of comfort and readiness. In addition, women who came to the same hospital for delivery and were aged  $\geq 20$  years were selected randomly in equal numbers within 24 h for comparison purposes, and constituted the controls.

### *Data collection*

A pretested semi-structured questionnaire in the Nepali language was used to interview 1359 patients. Female interviewers with health backgrounds were recruited and trained on sampling, interview techniques, and subjects' rights and comfort. Information on sociodemographic characteristics, reproductive history, and knowledge and practice on contraceptive methods was obtained. The data collection sheet is attached as supplementary file.

### *Major variables*

**Sociodemographic variables:** Marital status (marriage age, type), ethnicity (Brahmin and Chhetri or others), religion (Hindu or others), family type (nuclear, joint or extended), age of first pregnancy, educational status (of the patient and her husband), occupation (of patient and husband), family planning (knowledge and practice of patient), parent's education and work.

**Type of family:** Nuclear meant parents and children only, joint meant grandparents, parents, and children while extended meant including families of brothers and grandparents and children.

**Teenage pregnancy:** A pregnant woman under 20 years of age was the dependent variable for this study.

**Religion:** Hindu was the most common religion. Other religions included Christian, Muslims, and Buddhists.

**Educational status:** We recorded the academic level of the patient, her mother, and her husband. Education was categorized into two categories: "educated" referred to people who studied to Grade 8 or above and "uneducated" referred to illiterate people or those who studied to less than Grade 8.

**Occupation:** Classified into two categories: "employed" referred to people working for governmental or non-governmental organizations or doing their own business or labor and "un-employed" referred to people with no formal job/work but doing something to sustain life.

**Family planning knowledge:** Classified into two categories: those who knew about the basics of family planning, including family planning methods, were classified as "Yes" and those with no information or insight about family planning were classified as "No."



**Family planning practice:** Classified into two categories: those who used any family planning device were recorded as "Yes" and those who had never used any method of family planning were recorded as "No."

### Statistical analyses

Data were entered in EPIDATA version 2.0 and imported and analyzed using SPSS version 22 (Statistical Package for Social Sciences, Chicago, IL, United States). Univariate analyses were conducted for all studied variables and presented as the frequency and percentage in the appropriate tables to evaluate the distribution of each sociodemographic variable. Later cross-tabulation analyses were done between teen and non-teenage pregnancy using the  $\chi^2$  test and risk ratios. Finally, logistic regression analyses were run to estimate the odds ratios of relevant predicting variables to explore how predictor X (exposure variables) is related to Y (outcome variable) with a dichotomous response. We defined the response as  $Y = 0$  or  $1$ , where  $Y = 1$  denotes our event of interest occurrence; here, it was non-teenage pregnancy =  $0$  and teen pregnancy =  $1$ . The exposure variables were edited and made categorical for study convenience as appropriate. ArcGIS was used to evaluate the spatial distribution of patients enrolled in the study across Nepal based on their permanent residency address.

Teenage mothers were further divided into two groups for the analyses: age  $\leq 17$  years and age  $> 17$  years.

### Research ethics

Informed consent was provided from all respondents meeting the inclusion criteria before enrollment in the study. The study protocol was approved by the Ethical Review Board of Nepalese Health Research Council and conducted according to the protocol.

## RESULTS

A total of 5526 deliveries occurred in Paropakar maternity hospital in the study period from April 14, 2017 to August 14, 2017. Of the 1359 women, 679 teenage mothers (12.28%) matched to 680 non-teen mothers, were enrolled. The menarche age of the included cohort was  $13.55 \pm 1.342$  (range: 9-18) years. The majority of participants were married under age 20 with a mean age of marriage of  $17.57 \pm 1.994$  (range: 12-25) years. Most married females were living with their husbands, and more than two-thirds were in love marriages. Most reported their first pregnancy as teenagers at a mean age of  $18.50 \pm 2.145$  (range: 13-25) years. Nearly one-third of participants were from Brahmin and Chhetri ethnicity (upper caste), with the majority following Hinduism. In total, 58.9% of participants were living in a nuclear family, and 71.5% had above Grade 8 education. However, only 16.6% reported formal employment, and 79.8% said their pregnancy was planned (Table 1).

Based on the permanent address of residency among the participants in the study, spatial distribution showed that the majority of participants were from province three. Still, overall, the different districts of Nepal were represented. Therefore, 1337 individuals with permanent residency in Nepal were plotted after excluding 22 Indian national Figure 1. Details of address and sociodemographic determinants are included in the supplementary files (Supplementary Table 1, Supplementary material and Table 1).

Table 2 depicts each sociodemographic determinant of pregnancy and its association with teenage and non-teenage pregnancy. Determinants of teenage pregnancy were: age at marriage ( $P \leq 0.001$ ), love marriage ( $P \leq 0.001$ ), and being a teenager at first pregnancy ( $P \leq 0.001$ ). In addition, belonging to the upper caste ( $P = 0.001$ ), higher education of the patient ( $P \leq 0.001$ ) and husband ( $P = 0.002$ ), knowledge of family planning ( $P \leq 0.001$ ), and use of family planning ( $P \leq 0.001$ ) were negatively associated with teenage pregnancy (Table 2).

Arranged marriage has a 45% lower chance of teenage pregnancy compared to love marriage. Participants' education status of higher than Grade 8 showed a 33% lower chance of teen pregnancy as an outcome compared to education lower than Grade 8. Knowledge of family planning methods and use of any forms of family planning are associated with significantly lower teenage pregnancy rates (Table 3).

**Table 1 Socio-demographic profile of the participants, *n* = 1359**

Variables			<i>n</i> (%)
Type of pregnancy		Teen	679 (50.0)
		Non teenage	680 (50.0)
Age of marriage in yr		Teenage	1156 (85.1)
		Non-teenage	203 (14.9)
Living arrangement		Married and living with husband	1261 (92.8)
Marriage type		Love marriage	972 (71.5)
		Teen	938 (69.0)
Temporary address		In the Kathmandu valley	1116 (82.1)
		Outside the valley	243 (17.9)
Permanent address		In the Kathmandu valley	169 (12.4)
		Outside the Valley	1190 (87.6)
Ethnicity		Upper Caste	398 (29.3)
		Others	961 (70.7)
Religion		Hindu	1046 (77.0)
Family type		Nuclear	800 (58.9)
Education	Grade ≥ 8	Patient	972 (71.5)
		Husband	961 (70.7)
		Mother	71 (5.2)
	Illiterate/< Grade 8	Patient	387 (28.5)
		Husband	397 (29.2)
		Mother	1288 (94.8)
Employment	Formally employed	Patient	225 (16.6)
		Husband	644 (47.4)
	Unemployed	Patient	1134 (83.4)
		Husband	714 (52.5)
Knowledge of family planning		Yes	1141 (84.0)
Use of any family planning methods		No	887 (65.3)
Present pregnancy		Planned	1085 (79.8)

## DISCUSSION

Our cross-sectional study evaluated different sociodemographic factors responsible for teenage pregnancy in Nepal. The prevalence of adolescent pregnancy in Africa is 18.8%[9]. The teenage pregnancy prevalence was found to be 12.28% in the tertiary center of Nepal in our study, which is lower than the national rate of 19.8% of Nepal but is higher than the rate of 4.5% in South-Eastern Asia[14]. We found that early age at marriage is a significant factor associated with teenage pregnancy. In Nepal, early marriage occurs due to societal norms in which families marry their daughter at an early age, believing it will cut the expense[15]. Those married at an early age have decreased knowledge about reproductive health and contraception, leading to unwanted pregnancy. Similar findings of teenage pregnancy association with earlier marriage age have also been found in Africa[14]. A retrospective study showed the increased role of parents in early marriage without the daughter's consent[16]; however, most marriages in our research were love marriages. This might be explained because most of the study population lived in Kathmandu, although they were from outside the valley. Due to migration to Kathmandu, many teenage females gain independence and might have indulged in sexual relationships leading to marriage. Another significant finding of our study was that girls with higher



**Table 2 Cross-tabulation between teenage and non-teenage pregnancy and their distribution and association with sociodemographic variables**

Variables		Present pregnancy type		Unadjusted OR (95%CI)
		Non teenage, n (%)	Teen, n (%)	
Age marriage	Below 20	477 (41.3)	679 (58.7)	2.423 (2.262-2.596) <sup>1</sup>
Living arrangement	Married and living with husband	631 (50.0)	630 (50.0)	0.998 (0.662-1.506)
Marriage type	Love marriage	439 (45.2)	533 (54.8)	2.018 (1.585-2.570) <sup>1</sup>
Age 1 <sup>st</sup> pregnancy	Teen	259 (27.6)	679 (72.4)	3.622 (3.265-4.017) <sup>1</sup>
Temporary address	In the valley	569 (51.0)	547 (49.0)	1.237 (0.936-1.634)
Permanent address	In the valley	93 (55.0)	76 (45.0)	1.257 (0.909-1.737)
Ethnicity	Upper Caste	227 (57.0)	171 (43.0)	1.489 (1.176-1.884) <sup>1</sup>
Religion	Hindu	536 (51.2)	510 (48.8)	0.811 (0.629-1.044)
Family Type	Nuclear	404 (50.5)	396 (49.5)	0.956 (0.770-1.187)
Education-patient	Grade 8 or above	519 (53.4)	453 (46.6)	1.608 (1.267-2.041) <sup>1</sup>
Education-husband	Grade 8 or above	507 (52.8)	454 (47.2)	1.446 (1.143-1.830) <sup>1</sup>
Education-mother	Grade 8 or above	34 (47.9)	37 (52.1)	1.095(0.679-1.767)
Employment-patient	Unemployed	562 (49.6)	572 (50.4)	1.122 (0.843-1.495)
Employment-husband	Unemployed	357 (50.0)	357 (50.0)	1.006 (0.813-1.245)
Knowledge of family planning	Yes	626 (54.9)	515 (45.1)	3.692 (2.657-5.129) <sup>1</sup>
Use of any family planning methods	Yes	307 (65.0)	165 (35.0)	2.564 (2.034-3.232) <sup>1</sup>
Present pregnancy	Planned	548 (50.5)	537 (49.5)	0.911 (0.699-1.188)

<sup>1</sup>Statistically significant.

education more than Grade 8 have significantly decreased chances of pregnancy compared to illiterate or low education girls. This is in agreement with the Nepalese Demographic and Health Survey (NDHS), which showed that girls with an education of Grade 10 or more get pregnant 4 years later than uneducated ones, and about 44.1% of teenage pregnancies occur in uneducated or girls with education level of primary [3]. The pooled analyses of the data from three national NDHS surveys showed that teenage pregnancy is associated with a low level of education, similar to our study[7].

Similarly, a cross-sectional study done in another tertiary center of Nepal showed that teenage pregnancies were seen in females who dropped out of school for various reasons[8]. Also, the studies done by Sharma *et al*[15] and Shrestha[16] showed an increased association of teenage pregnancies with lower education levels[15,16]. There is a similar scenario of low education being associated with teenage pregnancy in Africa and South Asia because the lack of education prevents the empowerment of teenagers with the necessary skills and knowledge to prevent pregnancy[14,17].

The lack of knowledge of family planning and use of family planning methods were significantly associated with teenage pregnancies in our study. Social stigma prohibits discussion and education about reproductive health in Nepal, leading to unsafe sex. The retrospective study done by Shrestha[16] found that a minimal number of teenage girls used any form of contraception[16]. Although various studies have suggested that teenage girls know about contraception all over South Asia, the lack of proper contraception in teenagers is the main problem. Our study found that teenage girls lack this knowledge, which contributes to teenage pregnancy[17]. Similar findings of lack of sexual knowledge have been reported in Africa, as well as a lack of access to contraceptives and unfavorable attitude of the community towards contraception[14]. Our study found no association of teenage pregnancy with employment status, in contrast with the pooled analysis done by Poudel *et al*[7], who showed lower teenage pregnancy rates among skilled professional women[7].

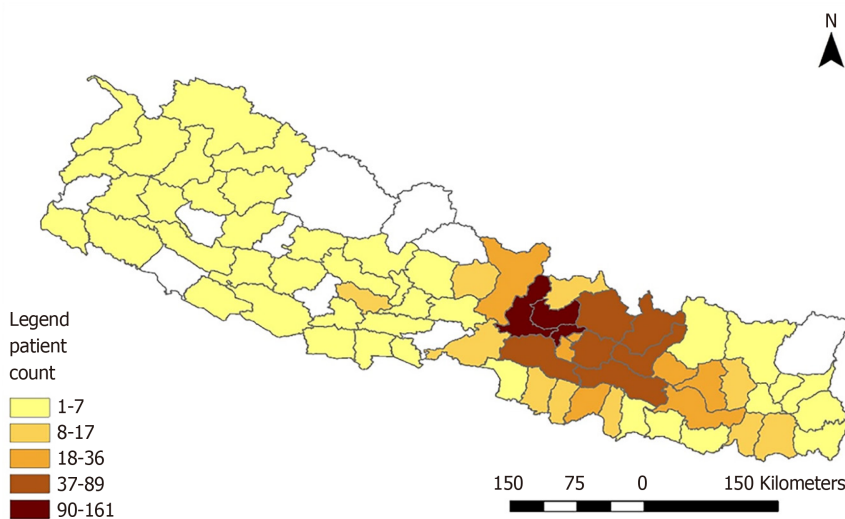
Similarly, we did not find an effect of upper caste on teenage pregnancy while doing multivariate logistic regression, unlike a prior study that showed a lower rate of teenage pregnancy in upper-caste like Brahmin and Chettri[10]. Our study found no

**Table 3 Binary logistic regression analysis of predictors of teen pregnancy**

Variables		Adjusted OR	95%CI for OR		P value
			Lower	Upper	
Marriage age	At or above 20	1.040	0.000	.	1.000
	Below 20 <sup>1</sup>				
Marital state and living with	Husband abroad, separated or others	0.902	0.477	1.708	0.752
	Married and living with husband <sup>1</sup>				
Marriage type	Arrange marriage	0.550	0.389	0.778	0.001 <sup>b</sup>
	Love marriage <sup>1</sup>				
1 <sup>st</sup> pregnancy based on age	Non Teen	0.000	0.000	.	0.993
	Teen <sup>1</sup>				
Temporary address	In the Kathmandu valley	1.093	0.699	1.710	0.696
	Outside the valley <sup>1</sup>				
Permanent address	In the Kathmandu valley	1.215	0.712	2.072	0.475
	Outside the valley <sup>1</sup>				
Ethnicity	Upper caste	0.884	0.619	1.260	0.495
	Others <sup>1</sup>				
Religion	Others	0.938	0.646	1.361	0.735
	Hindu <sup>1</sup>				
Family type	Joint or extended	1.192	0.826	1.722	0.348
	Nuclear <sup>1</sup>				
Education status	Grade 8 or above	0.670	0.522	0.861	0.002 <sup>b</sup>
	Illetrate or less than Grade 8 <sup>1</sup>				
Husband Education status	Grade 8 or above	0.783	0.611	1.003	0.053
	Illetrate or less than Grade 8 <sup>1</sup>				
Education status of Mother	Grade 8 or above	1.095	0.679	1.767	0.710
	Illiterate or less than Grade 8 <sup>1</sup>				
Employment status	Formally employed	0.988	0.646	1.511	0.956
	Unemployed <sup>1</sup>				
Husband Employment status	Formally employed	0.807	0.590	1.104	0.180
	Unemployed <sup>1</sup>				
Knowledge of family planning	Yes	0.474	0.288	0.779	0.003 <sup>b</sup>
	No <sup>1</sup>				
Use of any family planning methods	Yes	0.345	0.248	0.479	0.000 <sup>c</sup>
	No <sup>1</sup>				
Present pregnancy	Unplanned	0.911	0.635	1.307	0.612
	Planned <sup>1</sup>				

<sup>1</sup>Reference taken, 95% confidence interval and 5% standard error considered, with < 0.05 as significance.<sup>a</sup>P < 0.05.<sup>b</sup>P < 0.01.<sup>c</sup>P < 0.001.

association between religion and teenage pregnancy. However, a study done by Shrestha[16] found that Hindu teenagers are more likely to be pregnant than Buddhist teenagers[16]. There was no association between type of family and teenage pregnancy



**Figure 1** Spatial distribution of patients included in the study based on their permanent residency within Nepal.

in our study.

### **Limitations**

Although our study had an adequate sample size and good statistics, there were several limitations. First, our study was done in a tertiary center in the developed city of Kathmandu; hence it cannot be generalized to the entire population. Second, we did not evaluate the role of economic status in teenage pregnancy, a factor that is a strong determinant in teenage pregnancies[7,17].

## **CONCLUSION**

Teenage pregnancy constituted a significant proportion of deliveries at the urban referral center of Nepal. There was a significant association between teenage pregnancies and early age at marriage. Love marriages, low level of education, lack of knowledge of family planning and contraception were substantial determinants of teenage pregnancy.

## **ARTICLE HIGHLIGHTS**

### **Research background**

Teenage pregnancy is a global problem with increased prevalence in developing nations. It is associated with various maternal and neonatal complications. Multiple factors including rural residence, low level of education, and lack of contraceptive knowledge are believed to play a role in teenage pregnancy.

### **Research motivation**

Studies regarding the prevalence of teenage pregnancy and various associated factors associated are rare in Nepal. Therefore, our goal was to study the status of teenage pregnancy among patients visiting a tertiary center in the capital city of Nepal.

### **Research objectives**

The study's objective was to determine the proportion of teenage pregnancy and the effects of various sociodemographic factors on pregnant women visiting the tertiary center of Nepal.

### **Research methods**

We conducted a hospital-based cross-sectional study in a tertiary center from April to August 2017. Pregnant women were interviewed regarding their reproductive history and sociodemographic variables. Before the interview, informed consent was

provided, and ethical approval was given from Nepal Health Research Council.

### Research results

The prevalence of teenage pregnancy was 12.3%. More than four-fifths of the mothers were married under 20-years-old. Love marriage and first teenage pregnancy increased the odds for subsequent teenage pregnancies. On the other hand, knowledge of family planning methods and first teenage pregnancy lowered the odds of teenage pregnancy.

### Research conclusions

Teenage pregnancy was highly present at the tertiary center of Nepal. Teenage pregnancy was associated with marriage at an early age. Increased odds of teenage pregnancy were seen among mothers with low education, lack of knowledge of family planning, and use of contraception.

### Research perspectives

Developing nations like Nepal should focus on raising awareness of contraception and improving people's education and awareness to better tackle the adverse maternal and neonatal effects caused by teenage pregnancy.

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