



Trends in and Determinants of Adolescent Marriage, Childbirth, and Unmet Need for Family Planning, 2011–2022 Nepal DHS Surveys

DHS Further Analysis Reports No. 153

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This is one of 11 reports from a further analysis activity undertaken as part of the follow-up to the 2022 Nepal Demographic and Health Survey (NDHS). ICF provided technical assistance for the activity while USAID Learning for Development coordinated the activity. USAID Learning for Development also provided quality assurance and led the analysis of eight of the 11 reports, coordination with government stakeholders, and dissemination. ICF led the analysis of three of the reports.

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PREFACE

The 2022 Nepal Demographic and Health Survey (2022 NDHS) is the sixth survey of its kind implemented in the country as part of the worldwide Demographic and Health Surveys (DHS) Program. It was implemented under the aegis of the Ministry of Health and Population (MoHP) of the Government of Nepal with the objective of providing reliable, accurate, and up-to-date data for the country. The survey received funding from the United States Agency for International Development (USAID). 2022 NDHS information has assisted policymakers and program managers in policy formulation, monitoring, and designing programs and strategies for improving health services in Nepal. The 2022 NDHS is a key data source for tracking the progress of the Nepal Health Sector Strategic Plan 2023–2030 and the Sustainable Development Goal indicators.

The 2022 NDHS further analysis reports provide additional in-depth knowledge and insights into key issues that emerged from the 2022 NDHS. This information provides guidance for planning, implementing, refocusing, monitoring, and evaluating health programs in Nepal. This further analysis is also an important initiative to strengthen the technical capacity of Nepali professionals for analyzing and using large-scale data to better understand specific issues related to the country’s needs. We are glad that in the sixth round of the NDHS, we were able to produce 11 further analysis reports. We urge that all policymakers, program administrators, program managers, health workers, and other key stakeholders optimally use the information from these reports in program planning and management. High-quality evidence should be the basis of our health programs planning, implementation, monitoring, and evaluation.

Finally, we would like to appreciate the leadership of the Policy Planning and Monitoring Division, and the efforts of the different individuals of the MOHP, and the Department of Health Services in generating these reports. We are thankful to USAID Nepal for their continued support in implementing the NDHS and further analysis studies in Nepal.

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FOREWORD

The 2022 Nepal Demographic and Health Survey (2022 NDHS) is the sixth nationally representative comprehensive survey conducted as part of the worldwide Demographic and Health Surveys (DHS) Program in the country. The survey was implemented by New ERA under the aegis of the Ministry of Health and Population (MoHP). Technical support for this survey was provided by ICF, with financial support from the United States Agency for International Development (USAID) through its mission in Nepal.

The standard format of the survey’s final report included descriptive presentations of findings and trends but not of analytical methods that could ascertain the significance of differences and associations among variables. Thus, although largely sufficient, the final report is limited, particularly in providing answers to “why” questions-answers those are essential for reshaping important policies and programs. After the dissemination of the 2022 NDHS, the MoHP, USAID, and other health development partners convened and agreed on key areas that are necessary for assessing progress, gaps, and determinants in high-priority public health programs being implemented by the MoHP. In this context, 11 further analysis studies have been conducted by Nepali consultants under the direct leadership of the MoHP. The consultants were supported by USAID through the Learning for Development Activity in Nepal and through The DHS Program.

The primary objective of the analysis studies was to provide more in-depth knowledge and insights into key issues that emerged from the 2022 NDHS. This information provides guidance for planning, implementing, refocusing, monitoring, and evaluating health programs in Nepal. One of the learning objectives is to strengthen the technical capacity of Nepali professionals for analyzing and using data from complex national population and health surveys to better understand specific issues related to country needs.

The further analysis of the 2022 NDHS was the concerted effort of many individuals and institutions, and it is with the great pleasure that we acknowledge the work involved in producing this useful document. The participation and cooperation of the officials of the MoHP and the Department of Health Services are highly valued. We would like to extend our appreciation to USAID Nepal for providing financial support for the further analysis. We would also like to acknowledge The DHS Program for its technical assistance at all stages. Our sincere thanks also goes to the USAID Learning for Development Activity team for the overall management and coordination of the entire process. Our special appreciation goes to the Policy Planning and Monitoring Division, MoHP, for their efforts and dedication to the completion of the further analysis of the 2022 NDHS.

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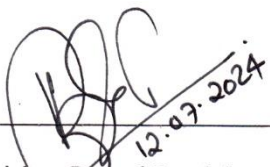
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The further analysis of the 2022 Nepal Demographic and Health Survey (2022 NDHS) was conducted under the aegis of the Policy Planning and Monitoring Division of the Ministry of Health and Population (MoHP). The United States Agency for International Development (USAID) provided financial support, with technical assistance provided by the Demographic and Health Surveys (DHS) Program. Overall coordination, recruitment of local consultants, facilitation, administration, and logistic support were provided by the USAID Learning for Development Activity.

I am indebted to Dr. Bikash Devkota, Additional Secretary of the MoHP, for his unwavering guidance throughout the analysis process. I would like to acknowledge the efforts of Dr. Push pa Raj Poudel, Mr. Ravi Kanta Mishra, Mr. Manoj Tamrakar from the Policy Planning and Monitoring Division/MoHP. My special gratitude goes to all the co-authors for their input, coordination, data analysis, and writing of reports. My special thanks go to the co-authors from the MoHP and the Department of Health Services (DoHS) who provided significant contribution to ensure that the analysis aligned with our data needs and to improve the quality of the reports. My sincere appreciation goes to the peer reviewers: Dr. Gunanidhi Sharma from MoHP, Kabita Aryal, Sagar Dahal, Dr. Abhiyan Gautam, Dr. Uttam Pachya, Dr. Poma Thapa, and Dr. Bibek Lal from the DoHS; Pradeep Poudel from USAID Learning for Development; Tirtha Tamang from the United Nations Population Fund; Milima Dangol; Bidur Bastola from the USAID Adolescent Reproductive Health project; Dr. Rahul Pradhan from the World Health Organization; Abhilasha Gurung, and Naveen Poudyal from the United Nations Children's Fund; and Dr. Saroj Dhakal, Dr. Jaganath Sharma, and Sabita Tuladhar from USAID for reviewing the reports.

Special thanks to Sabita Tuladhar from USAID for her continuous support of this process. My sincere appreciation to Dr. Kerry L. D. MacQuarrie from The DHS Program, Jade Lamb, Tarun Adhikari, Sagar Neupane, Lokesh Bhatta, and Alexandra Cervini from USAID Learning for Development for their hard work in supporting the completion of these 11 further analysis reports.


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ABSTRACT

Nepal's fertility rate has transitioned from a high level to a replacement level over the past few decades. However, despite slow declines over the past decade, the adolescent fertility rate has remained persistently high, posing threats to the health of both young mothers and their children. Realizing this context and the importance of understanding the drivers of adolescent childbearing for adolescent health policies and strategies, we conducted a further analysis of the 2022 Nepal Demographic and Health Survey (NDHS). As most childbearing in Nepal takes places within marriage, we paid particular attention to how adolescent childbearing may be linked to adolescent marriage and early family formation.

Trends in marriage, childbirth, and unmet need for family planning (FP) among adolescents were analyzed based on data from the 2011, 2016, and 2022 NDHS surveys. Data from the 2022 NDHS was then used to explore the background variables associated with adolescent pregnancy specifically. Adolescent marriage and childbirth were analyzed using information from women age 20–24, and unmet need was analyzed using information from women age 15–19. We also analyzed differentials and determinants of adolescent marriage and childbirth using the 2022 data, with a supplemental analysis examining modern FP use, demand for FP, satisfaction of FP demand, and determinants of modern FP use and unmet need for FP. Place of residence, education, province, caste/ethnicity, and wealth quintile were among the background variables used to examine the differentials.

The results showed no statistically significant decline in adolescent childbirth between 2011 and 2022, despite a small decline in adolescent marriage. Education and wealth quintile were the major variables significantly negatively associated with adolescent marriage and childbirth. Although unmet need for FP declined significantly among married adolescents between 2011 and 2022, the decline was not significant in the most recent period (2016–2022). Number of living children and whether a woman's husband/partner lived at home were the major variables significantly associated with modern FP use and unmet need for FP among married adolescents. Our results suggest that the slow decline in adolescent fertility in Nepal was mainly associated with a persistent pattern of early marriage followed by social pressure to have a child soon after marriage, which likely led to low demand and use of FP before adolescent childbearing and higher levels of unmet need afterward.

To notably reduce rates of adolescent childbearing, sociocultural norms and expectations about family formation must change, particularly relating to adolescent marriage. Toward this goal, health system policies should focus on delaying early marriage by implementing multisectoral interventions to reduce poverty, keep girls in school, and increase awareness about the unintended consequences of early marriage. Additionally, the postponement of first childbirth until after adolescence requires proper counseling and the use of FP. Expansion of adolescent-friendly FP services with a focus on quality may also help promote the use of modern FP methods and reduce unmet need for FP among adolescents.

Key words: marriage, childbirth, family planning, unmet need, adolescence

ACRONYMS AND ABBREVIATIONS

AOR	adjusted odds ratio
ASFR	age-specific fertility rate
CI	confidence interval
DHS	Demographic and Health Surveys
DoHS	Department of Health Services
FP	family planning
MoHP	Ministry of Health and Population
NDHS	Nepal Demographic and Health Survey
NHFS	Nepal Health Facility Survey
UNFPA	United Nations Population Fund
UNICEF	United Nations Children’s Fund
UOR	unadjusted odds ratio
USAID	United States Agency for International Development
WHO	World Health Organization

1 INTRODUCTION

According to the World Health Organization (WHO), “adolescents” refers to individuals age 10–19, “young adolescents” to those age 10–14, and “older adolescents” to those age 15–19.¹ Of the approximately 1.3 billion adolescents in the world (16.25% of the global population), 8.35% are young adolescents and 7.9% are older adolescents.² More than 6 million of these adolescents live in Nepal (20.15% of the national population), divided almost equally between younger and older adolescents.³

Adolescence is a transitional phase between childhood and adulthood when rapid physical, cognitive, and psychosocial growth occurs. It affects how young people feel, think, make decisions, and interact with the world around them. Adolescence establishes patterns of personal and social behaviors, including sexual and reproductive health behaviors that can persist throughout life. Adolescence is also a period of vulnerability as young people explore and learn about themselves, including how to protect their health and the health of others around them, sometimes putting their current and future health at risk. These risks include early family formation and childbearing, particularly for young women. Marriage and childbearing in adolescence are associated with adverse health outcomes for both mothers and their children, but remain common at the global level.⁴ In low- and middle-income countries, more than 20 million older adolescents are estimated to have been pregnant, with half of the pregnancies being unintended and some ending up with complications.⁵ Investments in the well-being of this large group of adolescents may bring a triple dividend of health and economic benefits—for adolescents now, for these same adolescents in the future, and for the next generation. Therefore, enhancing human capital at multiple levels is critical.

Adolescents face unique physical and emotional health challenges. Understanding their challenges and needs is necessary for designing and implementing strategies and programs that target this vulnerable population. Several health programs, including an adolescent FP program, have been designed and implemented to improve adolescent health in Nepal. The Nepal Health Policy 2019⁶ and the Nepal Health Sector Strategic Plan 2022–2030⁷ have prioritized adolescent sexual and reproductive health as a major component of reproductive health. In 2000, the Ministry of Health and Population also devised the National Adolescent Health and Development Strategy (revised in 2018), which includes adolescent-friendly health services as a key objective and comprehensive activities required to improve access to and utilization of adolescent sexual and reproductive health services.^{8,9} Additionally, Nepal has been a signatory to various international policy initiatives regarding child rights and has adopted the National Strategy to End Child Marriage by 2030.¹⁰

1.1 Adolescent Marriage, Childbirth, and Family Planning Use in Nepal

1.1.1 Marriage during adolescence

The age at which marriage is legally allowed in Nepal is 20 years.¹¹ However, the actual scenario is quite different, as marriage remains an adolescent experience for most women in Nepal,¹² who must also face the challenges of early childbearing.¹³ Recent Nepal Demographic and Health Survey (NDHS) reports do show that adolescent marriage is gradually declining. Based on data collected from women age 20–49, the median age at first marriage increased from 17.8 years in 2011 to 18.1 years in 2016 and then to 18.5 years in 2022.^{14,1–6} However, approximately two-thirds of the women age 25–49 reported they were married before age 20, with 50% marrying by about age 18. The decline in adolescent marriage was mostly due to declines

in marriage among early adolescents, with less change among older adolescents since 2006.¹² As reported by women age 20–24, 5.8% were married before age 15 and 35% before age 18.¹⁴

Various socioeconomic factors are associated with early marriage in Nepal. For example, further analysis of the 2016 NDHS found that rural young women had a significantly higher risk of lower age at marriage than their urban counterparts.¹³ Some provincial differences were also found, with a significantly higher risk of marriage at a young age among women in Madhesh, Karnali, and Gandaki provinces.¹³ Similarly, women from the Tarai/Madheshi, Dalit, and “Other” castes/ethnicities had higher risks of lower age at marriage than did those from the Brahmin/Chhetri groups.¹³ Earlier data from The Demographic and Health Surveys (DHS) Program showed that women’s educational status had a statistically significant inverse association with age at marriage.¹⁷

1.1.2 Childbirth during adolescence

Based on information collected from women age 20–24, the three most recent NDHS surveys showed a slow decline over time in the proportions of these women who had their first childbirth by age 15, 18, and 20 (Table 1). This decline seemed slower than the decline for adolescent marriage, suggesting that young couples may hurry to have children once they are married. A multicountry analysis of DHS data from South and Southeast Asia found that age at marriage in Nepal has a significant negative association with the first birth interval,¹⁸ meaning those who marry later have a shorter gap between marriage and the birth of their first child. This also suggests that a norm of early family formation coupled with persistent pressure to bear children immediately after marriage prevails in Nepal. Such a scenario may hinder the overall empowerment and freedom of young women, in part by hindering their educational and employment opportunities.¹⁹ Early childbearing may also be associated with adverse health outcomes for young women and their children.⁴

Table 1 Percentages of women age 20–24 who reported giving birth in adolescence by exact age at childbirth, 2011–2022 Nepal DHS surveys

Age at childbirth	NDHS 2011	NDHS 2016	NDHS 2022
15	1.4	1.1	1.0
18	19.4	16.1	15.1
20	39.1	38.6	35.7

NDHS = Nepal Demographic and Health Survey
Source: Previous three Nepal Demographic and Health Surveys^{14–16}

Table 2 shows declines over the past four decades in both the age-specific fertility rate (ASFR) for women age 15–19 and the total fertility rate among women of reproductive age (age 15–49) in Nepal, although the decline has been slower for adolescent fertility than for total fertility. Thus, despite the decline in ASFR, a large proportion of young women in Nepal continue to initiate childbearing before reaching age 20.¹⁸

Table 2 Status and changes over time in adolescent fertility and total fertility rates in Nepal, 1996–2022

	1996 NHFS	2001 NDHS	2006 NDHS	2011 NDHS	2016 NDHS	2022 NDHS
Reference period	1993–1995	1998–2000	2003–2005	2008–2010	2013–2015	2019–2021
Age-specific fertility rate for women age 15–19	127	110	98	81	88	71
Total fertility rate	4.6	4.1	3.1	2.6	2.3	2.1

NDHS = Nepal Demographic and Health Survey; NHFS = Nepal Health Facility Survey

Source: Previous four Nepal Demographic and Health Surveys and the 1996 Nepal Health Facility Survey^{14–16}

Note: Age-specific fertility rate is per 1,000 women age 15–19. Total fertility rate is per woman of reproductive age (age 15–49).

Nepal’s Sustainable Development Goal Target 3.7 is an adolescent fertility rate of 51 births per 1,000 adolescents by 2022 and 30 births per 1,000 adolescents by 2030.²⁰ Although the target total fertility rate for 2022 (2.1 births per woman of reproductive age) has been achieved, the ASFR for adolescents age 15–19 remains far from reaching the target.

1.1.2 Family planning use during adolescence

Although the use of FP is generally trending upward among currently married adolescents age 15–19, as of 2022 only a small proportion were using any method of FP (Table 3). The proportion using a modern FP method was substantially lower and had stagnated around 14%, despite efforts through the government’s FP program. Total demand for FP has remained consistently high around 60% (Table 3). However, the health system faces challenges of unmet need for FP, which was reported to be 30.9% overall in the 2022 NDHS. Among married adolescents, nearly half (48%) of the total demand for FP was satisfied, while use of modern FP methods contributed to only 24% of demand satisfaction.¹⁴

Table 3 Status and changes over time in indicators of family planning use among currently married women age 15–19, 2011–2022 Nepal DHS surveys

Indicator of FP use	2011 NDHS	2016 NDHS	2022 NDHS
Use of any method of FP (%)	17.6	23.1	28.2
Use of any modern method of FP (%)	14.4	14.5	14.2
Unmet need for FP (%)	41.5	34.9	30.9
Total demand for FP (%)	59.4	58.0	59.1
Unmet need out of total demand (%)	69.6	60.2	52.3

FP = family planning; NDHS = Nepal Demographic and Health Survey

Source: Previous three Nepal Demographic and Health Surveys^{14–16}

1.2 Study Rationale

The proximate determinant framework of fertility analysis considers marriage and contraceptive use as two of the four principal proximate determinants of fertility.²¹ Early marriage is associated with an early start to childbearing, and low use of FP methods favors high fertility. Nepal has one of the highest rates of child marriage among countries in Asia. The adolescent fertility rate is slowly declining but is still high at 71

births per 1,000 women age 15–19. Childbearing immediately after marriage is common in Nepal, so the use of FP methods before childbirth is considered uncommon. Thus, currently married adolescents have a high need for FP.

The contraceptive behavior of adolescents has a substantial role in shaping total fertility. Once adolescents enter the family-building process through early marriage, examining how these couples use FP methods for spacing and limiting childbirth is important. The Government of Nepal has emphasized reducing the ASFR to 30 births per 1,000 women age 15–19 by 2030.²² Achieving this target requires much faster declines in ASFR than in the past. Slow reduction in adolescent fertility and a low rate of modern FP use, coupled with a high unmet need for FP and a low proportion of demand satisfied, are of utmost concern.

Reasons for the slow reduction in adolescent fertility over the past two decades could include a slow change in mean age at marriage, no change in the tendency for adolescent to have a first childbirth quickly after marriage, or no change in FP behaviors. A detailed analysis of the dynamics of adolescent marriage, childbirth, and demand for and use of FP is needed to further our understanding of this phenomenon.

1.3 Objectives

The overall aim of this further analysis was to broaden our understanding of adolescent sexual and reproductive health dynamics with a focus on marriage, childbirth, and FP use. The findings will help tailor policies and programs more closely to adolescents' special sexual and reproductive health needs. Specifically, the aims of the study were:

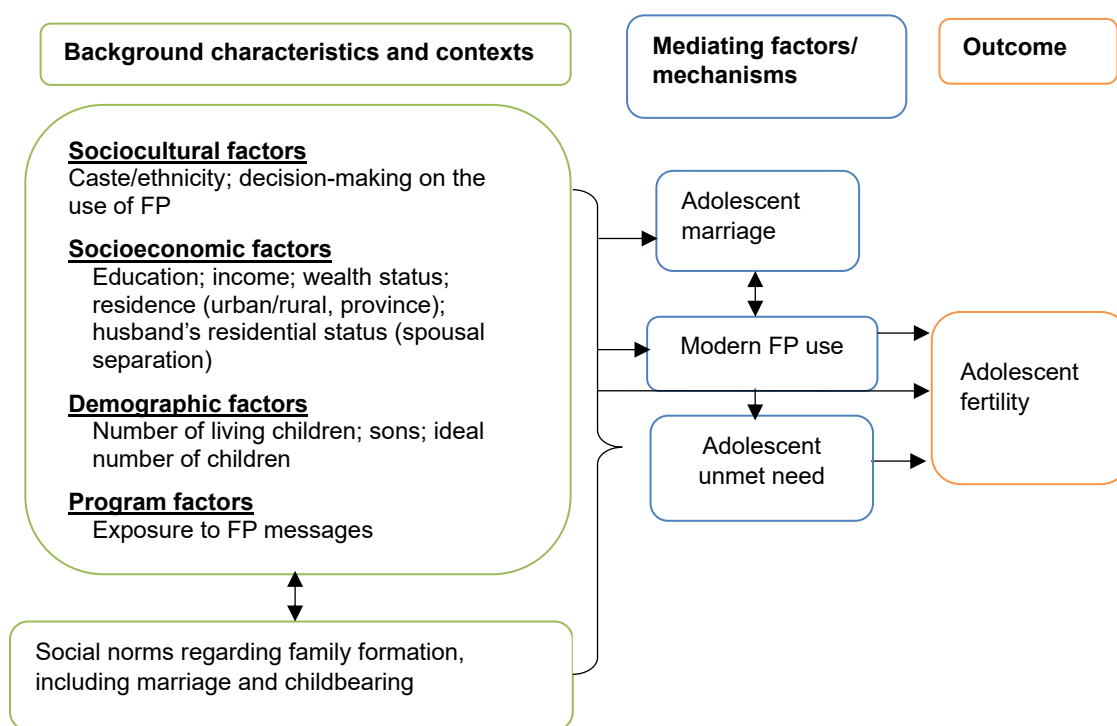
- To identify trends in marriage, childbirth, and unmet need for FP among adolescents between 2011 and 2022
- To investigate the factors associated with adolescent marriage, childbirth, unmet need for FP, and modern FP use

2 METHODS

2.1 Conceptual Framework

The framework guiding this study was adapted and revised from previous frameworks.^{21,24} According to the current framework (Figure 1), adolescent fertility is influenced by several factors, including the background characteristics and contexts of adolescents (i.e., sociocultural, socioeconomic, demographic, and programmatic factors) and the societal norms and values around marriage and childbearing. These factors operate through different mechanisms, such as adolescent marriage and adolescent use of modern family planning (FP) methods, and the complex interplay of factors and mechanisms determines rates of adolescent fertility.

Figure 1 Conceptual framework of factors influencing adolescent fertility



FP = family planning

Source: Adapted and revised from Bongaarts (1978)²¹ and Gizaw and Regassa (2011)²⁴

2.2 Data Sources

Trends in adolescent marriage, childbirth, and unmet need for FP were analyzed using data from three nationally representative cross-sectional household surveys: the 2011 Nepal Demographic and Health Survey (NDHS), the 2016 NDHS, and the 2022 NDHS. Adolescent marriage and childbirth were examined using information collected from all women age 20–24. Women in this age group had recently completed their adolescence and, therefore, were most likely to be able to completely capture the prevalence of experiences during that time. Unmet need for FP was examined among all adolescent women age 15–19 and among currently married adolescent women age 15–19.

Further analyses were conducted using data derived from the 2022 NDHS for 2,637 women age 20–24 and 2,643 adolescent women age 15–19. The survey’s detailed sampling design was previously described in the 2022 NDHS final report.¹⁴

2.3 Study Variables

2.3.1 Outcome variables

The main outcome variables for this study are listed in Box 1. Adolescent marriage was measured as a dichotomous variable, with respondents categorized into those experiencing first marriage in adolescence (age <20) and those not experiencing marriage in adolescence.

Similarly, for adolescent childbirth, respondents were categorized into those experiencing their first childbirth in adolescence (age <20) and those not having such an experience.

Box 1 Outcome variables

- Adolescent marriage
- Adolescent childbirth
- Adolescent unmet need
- Married adolescent unmet need

The definition of unmet need for FP followed that used in the 2022 NDHS final report and was based on applicable literature.²³ Unmet need for FP was disaggregated by marital status and number of living children. For some analyses, we separately examined use of any FP method, use of any modern FP method, total demand for FP, and whether demand was satisfied.

2.3.2 Independent background variables

Major background variables analyzed were place of residence (rural or urban), province, education, caste/ethnicity, and wealth quintile. Wealth quintile was approximated by a respondent’s household wealth compared with the wealth of all households in the dataset. Exposure to FP messages in the media, whether adolescent women lived with their husbands/partners, number of living children, and number of living sons were also analyzed. Table A1 presents a detailed description of each independent variable and how they were categorized.

2.4 Data Analyses

As per the study objectives, we first examined trends in each outcome variable over time using data from the 2011, 2016, and 2022 NDHS surveys. Changes were examined from 2011 to 2016, from 2016 to 2022, and from 2011 to 2022. The statistical significance of overall trends in the outcome variables were evaluated using regression-based proportion tests. We also compared cumulative proportions of those age 20–24 who had their first marriage, and separately their first childbirth, at specific ages in adolescence over the three surveys.

With the 2022 NDHS data, we then carried out a bivariate analysis of each outcome variable with selected background variables using cross-tabulation and chi-square tests. A bivariate analysis of unmet need was specifically conducted among married adolescent women ages 15–19 for use of any FP method, use of any modern FP method, total demand for FP, and demand satisfied. Finally, we carried out multivariate logistic regression analyses using data from the 2022 NDHS to examine the determinants of each key outcome variable in more detail.

The analyses of factors associated with adolescent marriage used data from all women age 20–24 in 2022. The outcome variable was binary (Yes/No), whereby those who experienced marriage in adolescence were coded as “1,” and those who did not were coded as “0.” Since we hypothesized that cultural practices and norms primarily drive marital behavior, caste/ethnicity was a key focus in this regression. After exploring bivariate associations, we introduced additional variables into the analyses to assess the overall association of key variables with the outcome. The results were expressed in terms of unadjusted and adjusted odds ratios along with 95% confidence intervals at a 5% significance level.

Logistic regression to examine the association of the variables with adolescent childbearing again used data from all women age 20–24. The outcome variable was a dichotomous (Yes/No) variable with those who had their first child as an adolescent (age <20) coded as “1” and those who did not coded as “0.” Since almost all births occur within marriage, another regression was carried out that included only ever-married women age 20–24 and an additional variable measuring “marital duration.”

Determinants of modern FP use and unmet need for FP were analyzed using data from currently married adolescent women age 15–19. Those who reported using a modern FP method were coded as “1” and those who did not as “0,” and those with any unmet need for FP were coded as “1” and those with no unmet need were coded as “0.” The analyses used logistic regression and included all the variables used in the bivariate analysis of group differentials of modern FP use and unmet need, plus the ideal number of children women reported and women’s involvement in decisions about FP use.

Standard sample weights were applied during data analysis to account for nonresponse and the unequal probability of selection in the sample. All the figures and percentage values provided in the tables were weighted. While analyzing the data for married adolescents, categories for some background variables, such as wealth quintile and caste/ethnicity, were suppressed if samples sizes were too small. Stata 18—in which the “svy” command used individual sample weight, strata, and clusters to account for the complex survey design the NDHS adopted—was used for all analyses.

3 RESULTS

3.1 Trends in Adolescent Marriage, Childbirth, and Unmet Need

Marriage during adolescence was common for women across all three surveys. In 2011, 60% of women age 20–24 reported experiencing their first marriage in adolescence; by 2022, the proportion had only slightly declined to 54% (Table 4). This decline was statistically significant, as was the decline for the period of 2016–2022 (Figure 2).

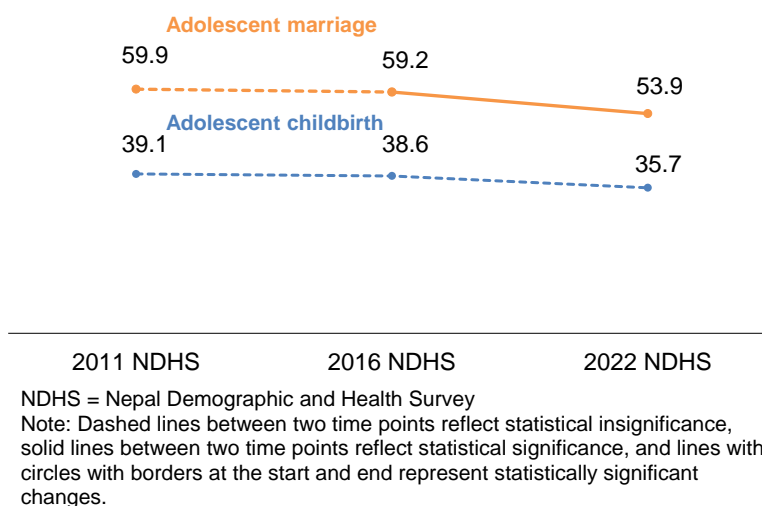
Table 4 Trends in adolescent marriage, childbirth, and unmet need, 2011–2022 Nepal DHS surveys

Outcome variable	2011 NDHS		2016 NDHS		2022 NDHS	
	%	Number	%	Number	%	Number
Adolescent marriage ^a	59.9	2,298	59.2	2,250	53.9	2,637
Adolescent childbirth ^a	39.1	2,298	38.6	2,250	35.7	2,637
Adolescent unmet need ^b	12.1	2,753	9.5	2,598	6.6	2,643
Married adolescent unmet need ^b	41.6	792	34.9	704	30.9	563

NDHS = Nepal Demographic and Health Survey
 Source: Previous three Nepal Demographic and Health Surveys^{14–16}
^a Data collected from women age 20–24
^b Data collected from adolescent women age 15–19

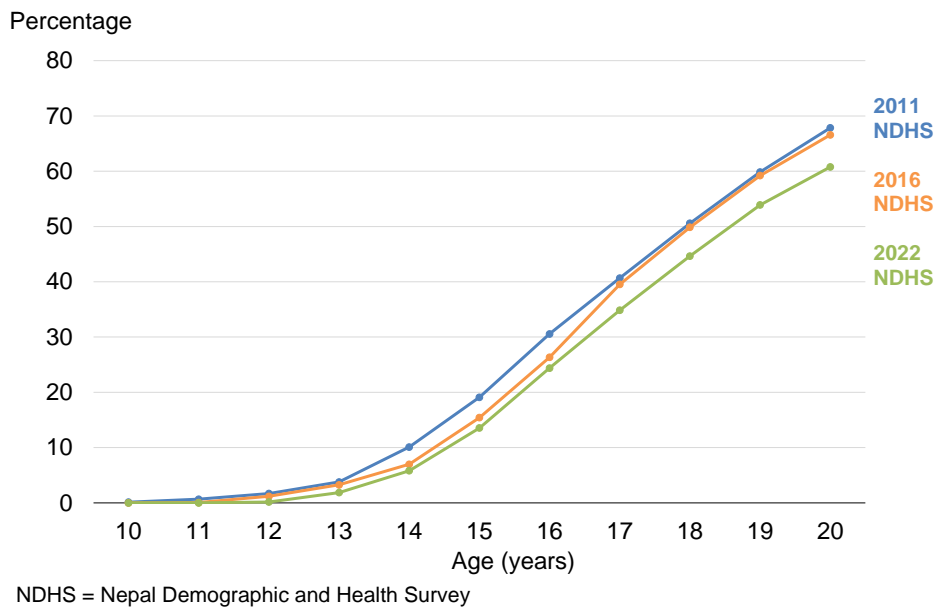
Early marriage was very often followed by early childbirth. In 2011, nearly two in five women age 20–24 (39%) reported giving birth to their first child in adolescence; in 2022, the proportion declined only marginally to 36%, and the difference was not statistically significant (Table 4 and Figure 2).

Figure 2 Percentages of women age 20–24 who had first marriage and who had first childbirth before age 20, 2011–2022 Nepal DHS surveys



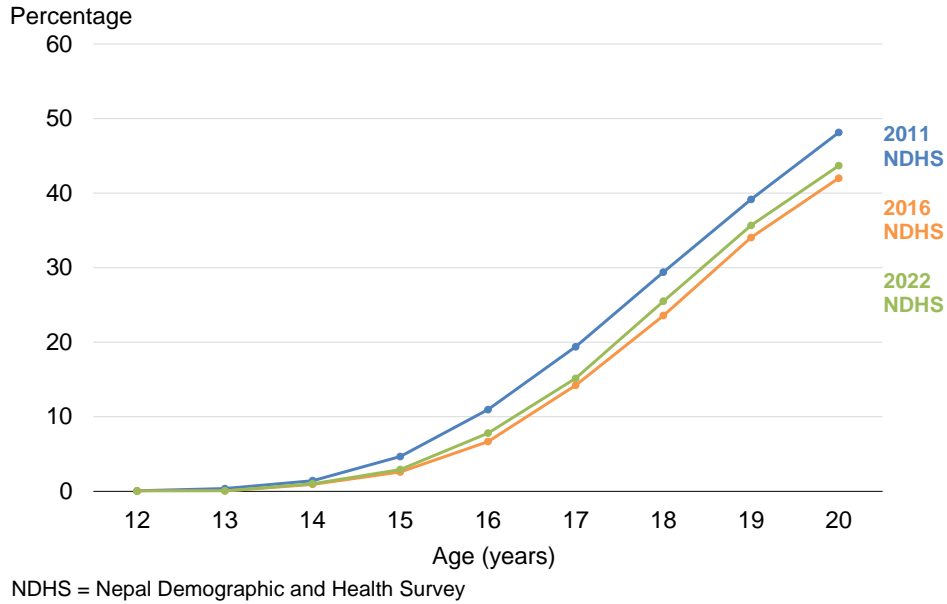
We further explored the dynamics of marriage and childbirth in adolescence by comparing the cumulative proportions of those age 20–24 who married, and separately those who had a child, during adolescence over the 2011, 2016, and 2022 NDHS surveys. Figure 3 shows not much change over time in the proportions of Nepali women who married at specific ages. However, some signs of a slow decline in adolescent marriage were observed. Overall, the proportion of women who were ever married by age 20 was lower in 2022 (60.8%) than in the other survey years (around 67.9% in 2011 and 66.6% in 2016). Furthermore, the curve for 2022 was positioned slightly below the curves for 2011 and 2016, suggesting that the proportion who married in adolescence was lower for almost all ages in 2022. The curve for 2016 also suggested a movement from marriage at younger adolescent ages to marriage at older adolescent ages (even while the total percentage marrying before age 20 was almost the same in 2016 and 2011).

Figure 3 Trends in the percentages of women age 20–24 who were ever married by exact ages, 2011–2022 Nepal DHS surveys



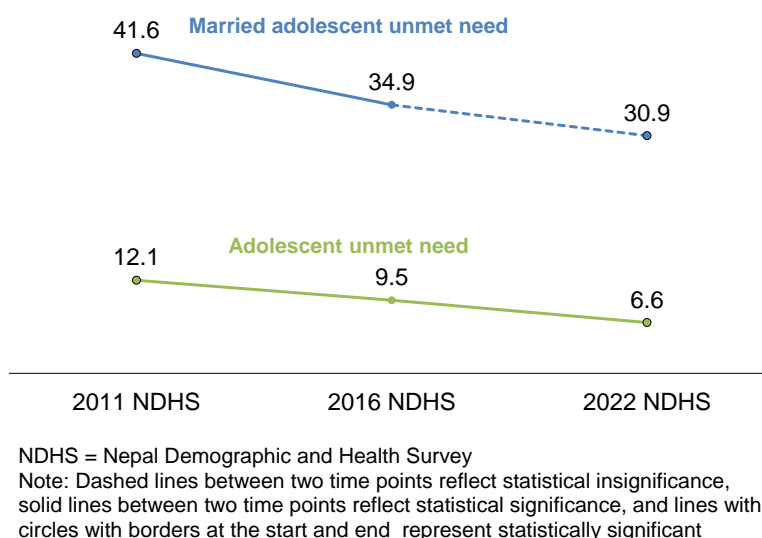
The curves showing the percentages of women who reported adolescent childbearing at exact ages (Figure 4) exhibited a similar pattern of progression in all three surveys, with minimal change over time in the proportion who had their first child before age 20 (48% in 2011, 42% in 2016, and 43% in 2022). Of note, the curve for 2022 was positioned slightly above that for 2016, potentially indicating a slight acceleration in first adolescent childbirth in more recent years. Overall, the changes in marriage progression, while relatively minor, were not equally reflected in experiences of first childbirth.

Figure 4 Trends in the percentages of women age 20–24 who had their first child by exact ages, 2011–2022 Nepal DHS surveys



Unmet need for FP among all adolescent women age 15–19 declined from 12% in 2011 to 6.6% in 2022 (see Table 4). The decline was statistically significant for the study periods of 2011–2016, 2016–2022, and 2011–2022. Among married adolescents age 15–19, unmet need for FP significantly declined by 10.5 percentage points between 2011 and 2022 (Figure 5). It significantly declined from 41.6% in 2011 to 34.9% in 2016 and declined again, though not significantly, to 30.9% in 2022.

Figure 5 Percentages of adolescent women and married adolescent women age 15–19 with unmet need for family planning, 2011–2022 Nepal DHS surveys



Further analysis of unmet need showed that, for both all adolescents and married adolescents, unmet need for FP was higher for women with at least one living child than for those with no living children, and this pattern remained throughout our study period. For example, 25% of married adolescents with no living children versus 38.3% of those with at least one living child had unmet need in 2022.

Table 5 shows that, regardless of whether the adolescents were married or already had children, their unmet need declined over time. Among married adolescents with no children, unmet need declined from 39% in 2011 to 25% in 2022. Similarly, among married adolescents with at least one child, unmet need declined from 45.3% in 2011 to 38.3% in 2022.

Table 5 Unmet need among all adolescents and married adolescents age 15–19, disaggregated by number of living children, 2011–2022 Nepal DHS surveys

Disaggregated variable	2011 NDHS		2016 NDHS		2022 NDHS	
	%	Number	%	Number	%	Number
No living children						
Adolescent unmet need	7.7	2,431	4.8	2,271	3.3	2,391
Married adolescent unmet need	39.1	470	28.9	380	25.0	313
At least one living child						
Adolescent unmet need	45.3	322	41.5	327	38.1	252
Married adolescent unmet need	45.3	322	42.0	324	38.3	250

Source: Previous three Nepal Demographic and Health Surveys^{14–16}

The declines in unmet need among all adolescents with children and all adolescents without children were statistically significant for the study periods of 2011–2016, 2016–2022, and 2011–2022 (Table 6). Among married adolescents with no children, the declines in unmet need were statistically significant for 2011–2016 and for 2011–2022 but insignificant for 2016–2022. Notably, the declines in unmet need among married adolescents with at least one child were insignificant for all three inter-survey periods, highlighting a persistently high unmet need in this group of young women (Table 6).

Table 6 Changes over time in unmet need among all adolescents and married adolescents age 15–19, disaggregated by number of living children, 2011–2022 Nepal DHS surveys

Disaggregated variable	Percentage-point change 2011–2016	Percentage-point change 2016–2022	Percentage-point change 2011–2022
No living children			
Adolescent unmet need	2.9**	1.6*	4.4***
Married adolescent unmet need	10.2*	3.9	14.1**
At least one living child			
Adolescent unmet need	3.8**	3.4*	7.2***
Married adolescent unmet need	3.3	3.7	7.0

* $p < .05$, ** $p < .01$, *** $p < .001$
Source: Previous three Nepal Demographic and Health Surveys^{14–16}

3.2 Differentials in Adolescent Marriage, Childbirth, Family Planning Use, and Unmet Need

After examining overall trends in the outcome variables, we examined adolescents’ relationships with selected background variables based on data from the 2022 NDHS. Table 7 presents distributions of women age 20–24 and married adolescent women age 15–19 by background variables. The distribution of respondents according to place of residence was similar for the two groups. However, the distributions were quite different according to all other background variables considered in the analysis.

As shown in Table 7, the largest share of married adolescents was in Madhesh province (35.3%) and the lowest was in Gandaki (7.3%). Regarding caste/ethnicity, Dalits made up the largest share of married adolescents (27.5%), followed by Hill Janajatis (18.9%) and Terai/Madheshis (18.6%); Brahmins made up the lowest proportion (2%). Almost half of married adolescents (48%) had basic education, two-fifths (39.4%) had secondary or higher education, and only a small proportion (12.7%) had no education. The highest wealth quintile made up the lowest share of married adolescents (5.5%), while the second (26.9%) and lowest (25%) wealth quintiles accounted for the highest proportions.

Table 7 Distribution of all women age 20–24 and currently married adolescent women age 15–19 by background variables, 2022 Nepal DHS

Variable	All women age 20–24		Currently married adolescent women age 15–19	
	%	Number (N=2,637)	%	Number (N=563)
Place of residence				
Urban	69.7	1,837	64.0	360
Rural	30.3	800	36.0	203
Province				
Koshi	16.9	455	14.5	82
Madhesh	22.7	599	35.3	198
Bagmati	18.11	478	10.6	60
Gandaki	8.52	225	7.3	41
Lumbini	18.23	481	13.7	77
Karnali	6.45	170	10.2	57
Sudurpaschim	9.11	240	8.5	48
Education				
No education	8.7	229	12.7	71
Basic education	28.1	742	47.9	270
Secondary or higher	63.2	1,666	39.4	222
Caste/ethnicity				
Brahmin	7.8	207	2.0	12
Chhetri	17.6	464	13.6	76
Terai/Madheshi	18.5	488	18.6	105
Dalit	15.5	408	27.5	155
Newar	3.1	83	2.3	13
Hill Janajati	22.5	592	18.9	106
Terai Janajati	10.5	277	7.8	44
Muslim	4.3	113	9.3	52
Other	0.2	6	0.0	0
Wealth quintile				
Lowest	18.1	477	25.0	141
Second	19.2	507	26.9	152
Middle	20	526	21.2	119
Fourth	23.2	612	21.4	120
Highest	19.5	515	5.5	31

3.2.1 Adolescent marriage and childbirth

Table 8 presents differentials in the experience of adolescent marriage and childbirth as recalled by women age 20–24 by selected background variables. Overall, 54% of women age 20–24 reported marriage and around 36% reported childbirth during adolescence. However, substantial differentials in these outcomes emerged when disaggregated into categories of background variables.

Marriage and childbirth in adolescence were both significantly associated with place of residence, with higher prevalences in rural areas than in urban areas. Among women residing in rural areas, 63.4% were married and 41.9% had their first child during adolescence. Among urban women, only half (49.8%) experienced adolescent marriage and only one-third (33%) experienced their first childbirth in adolescence.

Differences by province, education, and caste/ethnicity were also statistically significant for both outcomes. The percentage of women who married in adolescence was highest in Madhesh province (76.3%) and lowest in Bagmati (34.8%). Karnali province held the second position for both outcomes. Among uneducated women, 88% were married and 68% had their first child in adolescence. In contrast, among women with a secondary or higher education, only 36% experienced marriage and 20% experienced childbirth in adolescence. Regarding caste/ethnicity, both outcomes were least common among Newar

women (18% for marriage and 8% for childbirth) and most common among Dalits (70% for marriage and 53% for childbirth), followed by Muslims (68% for marriage and 48% for childbirth) and Terai/Madheshi (67% for marriage and 46% for childbirth).

Significant differentials existed in the experiences of adolescent marriage and childbirth by wealth quintile as well. Among women in the lowest wealth quintile, 74% experienced marriage in adolescence and 53% experienced childbirth in adolescence. In contrast, the proportions were only 25% for adolescent marriage and 13.4% for adolescent childbirth among women from the highest wealth quintile.

Table 8 Percentages of women age 20–24 who first married in adolescence and who had first childbirth in adolescence by background variables, 2022 Nepal DHS

Variable	Married in adolescence		Had first child in adolescence		Number (N=2,637)
	%	p value	%	p value	
Place of residence					
Urban	49.8		33.0		1,837
Rural	63.4	***	41.9	***	800
Province					
Koshi	52.8		35.4		455
Madhesh	76.3		54.4		599
Bagmati	34.8		22.2		478
Gandaki	39.5		24.1		225
Lumbini	47.8		28.2		481
Karnali	64.6		45.5		170
Sudurpaschim	56.1	***	35.0	***	240
Education					
No education	88.2		68.1		229
Basic education	82.6		60.7		742
Secondary or higher	36.4	***	20.0	***	1,666
Caste/ethnicity					
Brahmin	32.4		13.8		207
Chhetri	52.3		33.1		464
Terai/Madheshi	67.1		46.1		488
Dalit	69.9		52.9		408
Newar	17.9		8.2		83
Hill Janajati	48.5		30.4		592
Terai Janajati	41.9		26.3		277
Muslim	67.7		48.3		133
Other	-	***	-	***	6
Wealth quintile					
Lowest	73.7		52.9		477
Second	66.9		47.9		507
Middle	58.3		36.8		526
Fourth	48.1		29.8		612
Highest	25.3	***	13.4	***	515
Total	53.9		35.7		

*** $p < .001$

Note: A dash (-) indicates that a figure is based on less than 25 unweighted cases and has been suppressed.

3.2.2 Family planning use

Given the persistently high levels of both marriage and childbirth in adolescence, a closer examination of the use of FP among currently married adolescents was important in helping to understand the potential fertility motivations of adolescent women in Nepal. Table 9 shows the proportions of married adolescent women age 15–19 who reported using any method of FP and who reported using any modern method of FP in the 2022 NDHS, by background variables.

Overall, the rate of FP use among married adolescents was quite low. Less than a third (28.2%) were using any FP method, and only half of those (14.2%) were using a modern method. Although urban-rural differentials were not statistically significant for use of any FP method, rural women had significantly higher rates of modern FP use (18.5%) than their urban counterparts (11.8%).

Provincial variations were statistically significant for both use of any FP method and use of a modern method (Table 9). The highest rate of use of any FP method was in Koshi province (46.1%), and the lowest was in Madhesh (13.2%). The highest rate of modern FP use was in Lumbini (20.7%), and again the lowest was in Madhesh (4.3%).

Differentials by education were statistically significant only for use of any FP method, with more education associated with a higher rate of use. Among all castes/ethnicities, Hill Janajati and Dalits had the highest levels of use of both any FP method and any modern FP method. No significant variations in use were found based on wealth quintile.

Differentials in FP use were also examined by exposure to FP messages in the media, whether husbands/partners lived at home, number of living children, and number of living sons. Both use of any FP method and use of a modern method were significantly associated with exposure to FP messages. Among the married adolescents, 17% who were exposed to FP messages compared with only 9.9% of those who were not exposed to FP messages were currently using a modern method of FP.

Labor migration of men is common in Nepal and can have a large effect on both the need for and the use of FP. We found husband/partner separation to be significantly associated with both use of any method and use of a modern method (Table 9). Use of any FP method was almost three times more common when adolescents lived with their husbands/partners than if the husbands/partners were away from home (37% versus 14%). Similarly, use of modern methods was almost two times more common if adolescents lived with their husbands/partners (17.6% versus 9.9%).

Number of living children and number of living sons were also significantly associated with FP use (Table 9). Only 4.8% of married adolescents who had no children versus 26% who had at least one child were using a modern FP method. Similarly, only 9.4% of those with no sons versus 30.7% of those with at least one son were using a modern method. Motivation to use FP methods, particularly modern ones, seemed to be strengthened only after a young woman had at least one child, preferably a son.

Table 9 Percentages of currently married adolescent women age 15–19 who were using any method and were using any modern method of family planning by background variables, 2022 Nepal DHS

Variable	Any FP use		Modern FP use		Number (N=563)
	%	p value	%	p value	
Place of residence					
Urban	26.6		11.8		360
Rural	31.1		18.5	*	203
Province					
Koshi	46.1		20.4		82
Madhesh	13.2		4.3		198
Bagmati	(39.0)		(19.6)		60
Gandaki	(31.2)		(21.8)		41
Lumbini	31.8		20.7		77
Karnali	30.1		17.4		57
Sudurpaschim	36.0	***	17.2	***	48
Education					
No education	13.7		9.0		71
Basic	25.8		13.0		270
Secondary or higher	35.9	**	17.3		222
Caste/ethnicity					
Brahmin	-		-		12
Chhetri	27.7		12.9		76
Terai/Madheshi	16.2		4.8		105
Dalit	31.3		15.1		155
Newar	-		-		13
Hill Janajati	35.8		18.0		106
Terai Janajati	(39.6)		(34.8)		44
Muslim	(12.6)	**	(7.3)	***	52
Wealth quintile					
Lowest	29.2		19.8		141
Second	26.7		14		152
Middle	26.6		13.2		119
Fourth	30.5		10.4		120
Highest	(29.0)		(9.2)		31
Exposure to FP messages					
No	20.9		9.9		248
Yes	34.0	**	17.6	*	315
Living with husband/partner					
Yes	37.3		17.0		438
No	13.6	***	9.7	*	215
Number of living children					
None	21.8		4.8		313
One or more	36.3	***	26.0	***	250
Number of living sons					
None	25.1		9.4		436
One or more	39	**	30.7	***	127
Total	28.2		14.2		

* $p < .05$, ** $p < .01$, *** $p < .001$

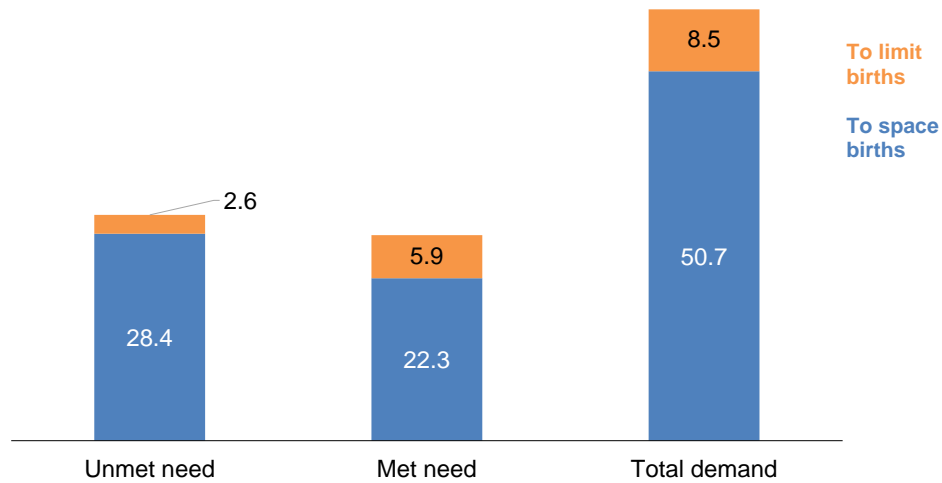
FP = family planning

Note: Figures in parentheses are based on 25–49 unweighted cases. A dash (-) indicates that a figure is based on less than 25 unweighted cases and has been suppressed.

3.2.3 Unmet need for family planning

Figure 6 shows the met and unmet need for FP in relation to total demand for FP among married adolescents. Among the 28.2% of married adolescents who were using FP (see Table 9), most used it for spacing childbirth (22.3% of all married adolescents), and a minority (5.9% of all married adolescents) used FP for limiting fertility. Almost a third of married adolescents (30.9%) reported an unmet need for FP, again mostly a need for spacing births (28.4% of all married adolescents), with a minority (2.6% of married adolescents) having unmet need for limiting purposes.

Figure 6 Percentages of met and unmet need in relation to demand, by reason for needing/using family planning, among currently married adolescent women age 15–19, 2022 Nepal DHS



As shown in Figure 6, the total demand for FP among married adolescent women was 59.2%. However, only 47.7% of the total demand was satisfied, with just 24.1% of it satisfied by modern methods (Figure 7).

Figure 7 Percentages of demand satisfied by any method and by modern methods of family planning among married adolescent women age 15–19, 2022 Nepal DHS

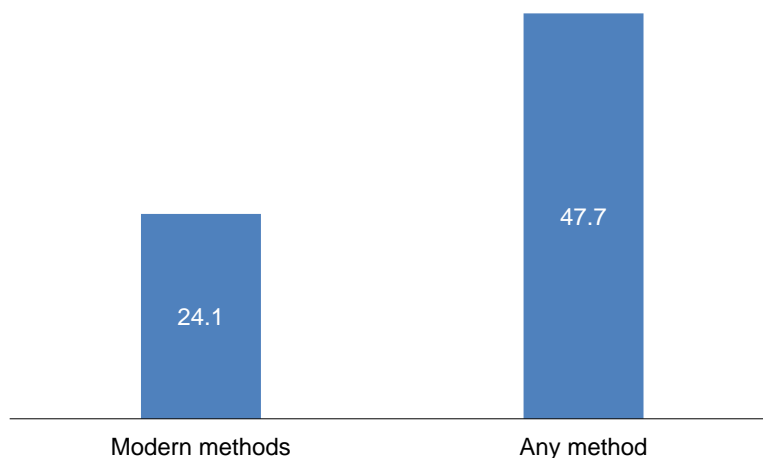


Table 10 further disaggregates unmet need, met need, total demand, and demand satisfied among married adolescents by background variables. In bivariate analysis, the number of living children was the only variable significantly associated with unmet need, met need, and total demand for FP. Differences by province, education, exposure to FP messages, and number of living sons were statistically significant for met need and total demand for FP, but not for unmet need. Whether adolescents were living with their husbands/partners was significantly associated with unmet need and met need for FP.

The highest proportions of unmet need were in Karnali province (37.2%), among uneducated adolescents (35.2%), in adolescents of Chhetri ethnicity (37.5%), and among the lowest wealth quintile (36.3%). Similarly, unmet need was more common among married adolescents whose husbands were away from home (50.7%), among those with at least one child (38.3%), and among those with at least one son (36.4%).

Met need (i.e., current use of FP) was least common in Madhesh province (13.2%), among uneducated adolescents (13.7%), in Terai/Madheshi castes (16.2%), and among women whose husbands/partners were not residing with them (13.6%). Total demand also varied by categories within the different variables (Table 10). Total demand was drastically different between adolescents with no children (46.7%) and those with at least one child (74.6%), and between adolescents with no sons (54.4%) and those with at least one son (75.4%).

The proportions of adolescents whose demand was satisfied by modern methods were statistically significantly associated with the province they lived in, caste/ethnic group, whether they were living with their husband/partner, the number of living children they had, and the number of living sons they had at the bivariate level. Most specifically, use was noticeably lower for the following subgroups: those living in Madhesh province (9.4%), those in the Terai/Madheshi caste (10.7%), those in the Chhetri caste (19.9%), those not exposed to FP messages (19.9%), those whose husbands/partners were not living with them

(15.1%), those with no living children (10.3%), and those with no living sons (17.3%). The proportions whose demand was satisfied by either modern or traditional methods were significantly associated with province and whether they lived with their husband/partner. In both cases, the patterns were similar to that for modern contraceptive methods.

Table 10 Need and demand for family planning among currently married adolescent women age 15–19 by background variables, 2022 Nepal DHS

Variable	Unmet need	Met need	Total demand	Demand satisfied		Number
	%	%	%	Modern methods (%)	Any method (%)	
Place of residence	NS	NS	NS	NS	NS	
Urban	30.8	26.6	57.4	20.5	46.3	360
Rural	31.0	31.1	62.1	29.8	50.0	203
Province	NS	***	***	*	***	
Koshi	25.2	46.1	71.3	28.6	64.7	82
Madhesh	33.0	13.2	46.2	9.4	28.6	198
Bagmati	(21.6)	(38.9)	(60.5)	(32.4)	(64.3)	60
Gandaki	(24.6)	(31.2)	(55.8)	(39.1)	(55.9)	41
Lumbini	35.0	31.8	66.8	31.0	47.6	77
Karnali	37.2	30.1	67.3	25.8	44.7	57
Sudurpaschim	34.7	36.0	70.7	24.3	50.9	48
Education	NS	**	*	NS	NS	
No education	35.2	13.7	48.9	18.4	28.0	71
Basic education	28.1	25.8	53.9	24.2	47.7	270
Secondary or higher	32.9	35.9	68.8	25.2	52.2	222
Caste/ethnicity	NS	**	NS	**	NS	
Brahmin	-	-	-	-	-	12
Chhetri	37.5	27.7	65.2	19.9	42.5	76
Terai/Madheshi	28.3	16.2	44.6	10.7	36.4	105
Dalit	31.8	31.3	63.1	24.0	49.5	155
Newar	-	-	-	-	-	13
Hill Janajati	26.7	35.8	62.5	28.8	57.3	106
Terai Janajati	(24.5)	(39.6)	(64.1)	(54.4)	(61.8)	44
Muslim	(35.5)	(12.6)	(48.1)	(15.1)	(26.2)	52
Wealth quintile	*	NS	NS	NS	NS	
Lowest	36.3	29.2	65.5	30.2	44.5	141
Second	33.2	26.7	59.9	23.3	44.6	152
Middle	25.7	26.6	52.3	25.2	50.8	119
Fourth	22.9	30.5	53.4	19.4	57.1	120
Highest	(46.3)	(29.0)	(75.3)	(12.2)	(38.5)	31
Exposure to FP messages	NS	**	***	NS	NS	
No	28.7	20.9	49.7	19.9	42.1	248
Yes	32.6	34.0	66.6	26.5	51.0	315
Living with husband/partner	***	***	NS	**	***	
Yes	18.7	37.3	56.0	30.4	66.6	348
No	50.7	13.6	64.3	15.1	21.1	215
Number of living children	**	***	***	***	NS	
None	25.0	21.8	46.7	10.3	46.6	313
One or more	38.3	36.3	74.6	34.9	48.6	250
Number of living sons	NS	**	***	***	NS	
None	29.3	25.1	54.4	17.3	46.1	436
One or more	36.4	39.0	75.4	40.7	51.7	127
Total	30.9	28.2	59.2	24.1	47.7	563

* $p < .05$, ** $p < .01$, *** $p < .001$

FP = family planning; NS = not significant

Note: Figures in parentheses are based on 25–49 unweighted cases. A dash (-) indicates that a figure is based on less than 25 unweighted cases and has been suppressed.

3.3 Determinants of Adolescent Behaviors

3.3.1 Determinants of adolescent marriage

Using data from all women age 20–24 in 2022, we first explored bivariate associations between adolescent marriage and background variables and then introduced additional variables into the analyses to assess the overall association of key variables with the outcome. The results, expressed in terms of unadjusted odds ratios (UORs) and adjusted odds ratios (AORs), are presented in Table 11. More detailed results are available in Table A2.

In the bivariate regression analyses, caste/ethnicity, education, wealth quintile, place of residence, and province all exhibited statistically significant associations with the experience of adolescent marriage. As caste/ethnicity was the primary variable of interest, we first included that and then added other potential variables that might influence marital behavior (i.e., education, wealth quintile, and place of residence) one by one. In doing so, associations with some castes/ethnicities lost significance while others retained their significance. The odds of experiencing adolescent marriage remained significantly higher among the Terai/Madheshi caste and Dalits than among Newar women (see Models I, III, and III in Table A2). The effects of education, wealth, and residence remained significant, with slightly decreased odds ratios when simultaneously included in the regression models for caste/ethnicity.

When all four variables were included in the analyses (see Table 11 and Model IV in Table A2), place of residence lost significance, and none of the castes/ethnicities were significantly associated with adolescent marriage. However, education and wealth quintile retained their statistically significant associations with adolescent marriage. In the model with caste/ethnicity, education, wealth quintile, and place of residence (Table 11), when women with no education were compared with women with secondary education, the odds of adolescent marriage were reduced by 89% among the women with secondary education, and the odds of women marrying as adolescents were 0.02 if they had more than secondary education. Of note, the causal direction of the association between education and adolescent marriage was likely bidirectional, with education potentially representing either a determinant or an outcome of the decision to marry as an adolescent. Similarly, compared with women from the lowest wealth quintile, those in the middle, fourth, and highest quintiles showed significantly lower odds of experiencing child marriage (middle=0.63, fourth=0.54, and highest=0.28). After controlling for other variables, education and wealth quintile were the most powerful predictors of adolescent marriage.

Table 11 Determinants of adolescent marriage: odds ratios from logistic regression among women age 20–24, 2022 Nepal DHS

Variable	UOR	95% CI	AOR	95% CI
Caste/ethnicity				
Brahmin	2.19	0.73–6.62	1.54	0.51–4.63
Chhettri	5.03**	1.7–14.89	2.00	0.67–5.95
Terai/Madheshi	9.37***	3.1–28.32	2.73	0.89–8.37
Dalit	10.63***	3.58–31.6	1.88	0.62–5.63
Newar (Ref.)				
Hill Janajati	4.34**	1.51–12.41	1.33	0.46–3.83
Terai Janajati	3.31*	1.11–9.93	0.86	0.28–2.66
Muslim	9.63***	3.01–30.81	1.00	0.3–3.34
Other	13.38	0.94–191.06	4.99	0.6–41.56
Education				
No education (Ref.)				
Basic education	0.67	0.42–1.06	0.71	0.43–1.17
Secondary education	0.09***	0.05–0.14	0.11***	0.07–0.19
Higher education	0.01***	0.01–0.03	0.02***	0.01–0.06
Wealth quintile				
Lowest (Ref.)				
Second	0.72*	0.53–0.98	0.82	0.58–1.15
Middle	0.5***	0.37–0.67	0.63**	0.45–0.89
Fourth	0.33***	0.25–0.44	0.54***	0.4–0.75
Highest	0.12***	0.08–0.17	0.28***	0.19–0.42
Place of residence				
Urban (Ref.)				
Rural	1.75***	1.42–2.15	1.12	0.9–1.39
Province				
Koshi	2.09***	1.46–2.99		
Madhesh	6.04***	3.91–9.32		
Bagmati (Ref.)				
Gandaki	1.22	0.73–2.04		
Lumbini	1.71**	1.15–2.55		
Karnali	3.41***	2.06–5.66		
Sudurpaschim	2.39***	1.56–3.66		
Constant			5.95**	1.79–19.74
Number of cases (unweighted)		2,623		

* $p < .05$, ** $p < .01$, *** $p < .001$
AOR = adjusted odds ratio; CI = confidence interval; Ref. = reference category; UOR = unadjusted odds ratio

3.3.2 Determinants of adolescent childbirth

Logistic regression was also used to examine the association of the same background variables with adolescent childbirth, again using data from all women age 20–24 in 2022. Since almost all births occur within marriage, another regression was carried out that included only ever-married women age 20–24 and an additional variable measuring “marital duration.” Table 12 presents the results of those analyses.

The results were broadly similar to those for adolescent marriage, except that some castes/ethnicities remained significantly associated with adolescent childbirth after controlling for the other variables in the model. Controlling for the other variables, women from the Terai/Madheshi caste (AOR=2.74) and Dalits (AOR=2.44) had significantly higher odds of adolescent childbirth than did Newar women. Education and wealth quintile were the variables most significantly associated with adolescent childbirth. The odds of adolescent childbirth were significantly reduced by 81% among women with secondary education and by 99% among women with higher education when compared with uneducated women. Relative to those in

the lowest wealth quintile, women in all other wealth quintiles had significantly lower odds of adolescent childbirth, ranging from about 40% to 60% of the odds for the reference category.

Among ever-married women, the association between caste/ethnicity and adolescent childbirth lost its statistical significance when marital duration was included in the regression model (Table 12). However, the significant associations with education and wealth quintile were retained, even after controlling for marital duration and other variables. The results reinforced the finding that education and wealth quintile were the most important predictors of childbirth in adolescence. However, the results also suggested that cultural factors may play a role (mainly if they act as determinants of education).

Table 12 Determinants of adolescent childbirth: odds ratios from logistic regression among all women and ever-married women age 20–24, 2022 Nepal DHS

Variable	Model I (all women)		Model II (ever-married women)	
	AOR	95% CI	AOR	95% CI
Caste/ethnicity				
Brahmin	1.18	0.49–2.88	0.55	0.24–1.26
Chhettri	2.16	0.91–5.12	0.99	0.46–2.12
Terai/Madheshi	2.74*	1.14–6.55	1.13	0.53–2.41
Dalit	2.44*	1.01–5.88	1.28	0.58–2.84
Newar (Ref.)				
Hill Janajati	1.52	0.65–3.53	0.83	0.39–1.77
Terai Janajati	1.15	0.47–2.79	0.69	0.32–1.49
Muslim	1.58	0.59–4.23	1.06	0.41–2.74
Other	7.19*	1.19–43.4	7.36*	1.56–34.75
Education				
No education (Ref.)				
Basic education	0.84	0.59–1.21	0.87	0.57–1.33
Secondary education	0.19***	0.13–0.27	0.39***	0.25–0.6
Higher education	0.01***	0–0.04	0.03***	0.01–0.15
Wealth quintile				
Lowest (Ref.)				
Second	0.87	0.65–1.16	0.93	0.68–1.27
Middle	0.6***	0.45–0.81	0.67*	0.48–0.94
Fourth	0.58***	0.42–0.79	0.73	0.51–1.05
Highest	0.31***	0.21–0.47	0.56*	0.35–0.89
Place of residence				
Urban (Ref.)				
Rural	0.99	0.8–1.23	0.89	0.7–1.13
Marital duration				
Up to 2 years (Ref.)				
More than 2 years			14.44***	9.08–22.96
Constant	1.33	0.52–3.36	0.26**	0.1–0.68
Number of cases (unweighted)		2,623		1,897

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

AOR = adjusted odds ratio; CI = confidence interval; Ref. = reference category

3.3.3 Determinants of modern family planning use and unmet need

The determinants of modern FP use and unmet need for FP were analyzed using data from currently married women age 15–19 in 2022. Logistic regression included all the variables used in the bivariate analysis of modern FP use and unmet need, plus the ideal number of children the adolescents reported and the adolescents' involvement in decisions about FP. Table 13 presents the results.

After controlling for other variables, the odds of modern FP use were 1.89 times higher among married adolescents residing in rural areas than among their urban counterparts, and the association was statistically significant. Married adolescents living in Madhesh province had significantly lower odds of modern FP use (AOR=0.13) than those living in Bagmati. The odds of using a modern method was 72% lower among women not living with their husbands/partners than among those living with them. Number of living children was significantly associated with modern FP use among married adolescents, with the odds of using a modern FP method 10 times higher for women who already had a child. Finally, the odds of modern FP use were significantly higher if the women made their own FP decision than if the decisions were made by someone else.

Place of residence was not significantly associated with unmet need for FP after controlling for other factors. The odds of experiencing unmet need were significantly higher in Madhesh province (AOR=4.00) than in Bagmati province, and were significantly lower among women in the middle wealth quintile (AOR=0.48) than among those in the lowest wealth quintile (though this association was not statistically significant for the other wealth quintiles). As was the case for modern FP use, the number of living children and whether husbands/partners were living with the adolescents were significantly associated with unmet need. Compared with women whose husbands/partners resided with them, those whose husbands/partners lived elsewhere had four and a half times higher odds of adolescent childbirth. Unmet need among married adolescents was 80% higher among those who had a child than among those who had no children.

Table 13 Determinants of modern family planning use and unmet need: odds ratios from logistic regression among currently married women age 15–19, 2022 Nepal DHS

Variable	Modern FP use		Unmet need for FP	
	AOR	95% CI	AOR	95% CI
Place of residence				
Urban (Ref.)				
Rural	1.89*	1.07–3.33	0.85	0.54–1.32
Province				
Koshi	0.37	0.13–1.09	1.73	0.74–4.06
Madhesh	0.13**	0.03–0.5	4.07**	1.51–10.96
Bagmati (Ref.)				
Gandaki	0.35	0.11–1.08	1.22	0.49–3.07
Lumbini	0.77	0.23–2.54	2.64	0.98–7.15
Karnali	0.52	0.16–1.66	1.94	0.76–4.93
Sudurpaschim	0.60	0.19–1.94	1.98	0.73–5.37
Education				
No education (Ref.)				
Basic education	0.39	0.12–1.32	0.91	0.32–2.57
Secondary education	0.61	0.16–2.24	1.50	0.53–4.27
Caste/Ethnicity				
Brahmin (Ref.)				
Chhettri	0.25	0.05–1.21	1.23	0.39–3.89
Terai/Madheshi	0.33	0.05–2.1	0.96	0.24–3.89
Dalit	0.55	0.11–2.63	1.22	0.37–3.97
Newar	0.18	0.01–3.21	3.79	0.52–27.84
Hill Janajati	0.48	0.1–2.4	1.62	0.47–5.55
Terai Janajati	1.86	0.36–9.58	1.07	0.28–4.05
Muslim	0.47	0.07–3.3	1.56	0.29–8.3
Wealth quintile				
Lowest (Ref.)				
Second	1.14	0.53–2.45	0.78	0.45–1.36
Middle	0.97	0.4–2.34	0.48*	0.24–0.96
Fourth	1.16	0.42–3.23	0.50	0.23–1.12
Highest	0.89	0.2–3.9	1.41	0.49–4.1
Exposure to FP messages				
No (Ref.)				
Yes	1.37	0.71–2.64	1.07	0.66–1.74
Living with husband/partner				
Yes (Ref.)				
No	0.28***	0.14–0.55	4.53***	2.89–7.09
Number of living children				
None (Ref.)				
One or more	9.96***	5.13–19.35	1.8**	1.19–2.73
Ideal number of children				
One or less (Ref.)				
Two	0.91	0.46–1.82	0.97	0.57–1.63
Three or more	0.38	0.06–2.57	0.54	0.19–1.53
FP decisions				
By self	4.5*	1.37–14.81	0.58	0.22–1.52
Joint	0.84	0.32–2.23	0.85	0.44–1.65
By others (Ref.)				
Constant	0.37	0.03–4.23	0.09*	0.01–0.58
Number of cases (unweighted)	629		629	

* $p < .05$, ** $p < .01$, *** $p < .001$

AOR = adjusted odds ratio; CI = confidence interval; FP = family planning; Ref. = reference category

4 DISCUSSION

4.1 Slow Decline and High Level of Adolescent Childbirth

Recent research in Nepal have shown that adolescent childbirth has not declined significantly⁹, which this study confirmed. Similarly, the pattern of progression in the percentages of women who experienced childbirth at exact ages was the same in the 2011 Nepal Demographic and Health Survey (NDHS), the 2016 NDHS, and the 2022 NDHS, with 43% (a high level) of women experiencing their first childbirth by age 20 years in 2022. Sustained high adolescent fertility is largely due to the high prevalence of adolescent marriage followed by childbirth soon afterward. However, the results suggest that an increase in age at marriage does not lead to an equal shift in age at first birth in Nepal. Although there have been small declines in adolescent marriage over time, adolescent childbirth has not yet mirrored this decline. This suggests a “squeeze” in the first birth interval (from marriage to first childbirth) that is accompanied by an increase in age at marriage in Nepal.¹⁸ Social pressure, in which newly married couples in Nepal feel pressured by in-laws and society to bear children soon after marriage,²⁵ may result in shorter first birth intervals. Married adolescents are unlikely to be an exception to this because fertility pressure from in-laws is most pronounced at lower parities.²⁶

Furthermore, newly married couples may not have the skills to effectively communicate with each other about their desire to delay childbirth. Even if they want to delay their first birth, many young women have low decision-making status in this matter.^{18,25} Lack of proper communication about fertility desires and low decision-making status among young women might have played a role in childbirth soon after marriage. In the 2022 NDHS, one-fourth of adolescent mothers reported that their last child was unwanted.¹⁴ Pressure to have a child soon after marriage was also reflected in the survey, to some extent, as 9% of adolescent women stated that they were pressured to become pregnant by their husbands/partners or other family members.¹⁴ Finally, adolescent women’s lack of knowledge about their fertile period might have led to unwanted pregnancies. Only 19% of adolescents in the 2022 NDHS could correctly identify their fertile period.¹⁴ These results indicate that married adolescents cannot fully materialize their fertility desires and postpone first childbirth due to various reasons, putting them at risk of early childbearing and the unintended consequences it has for their own and their children’s health.

Comparing our results with previous studies suggests that wealth quintile has become a more prominent factor associated with adolescent childbirth in recent years.^{13,27} Similarly, the educational threshold for significantly negatively influencing adolescent childbirth seems to be changing; the threshold was primary education in 2011 and changed to at least secondary education after that.^{8,21} Studies from African countries have also confirmed that women’s secondary education has a strong negative influence on adolescent childbirth.¹⁷ Confirming findings from the previous further analysis,⁸ our study showed a higher prevalence of adolescent childbirth among Terai/Madheshi women and Dalits than among women of other castes/ethnicities. This may be due to more social pressure in these groups to have children soon after marriage and to not use any contraception before having a child.

Adolescents with low levels of education or low wealth status had higher odds of experiencing childbirth in Nepal. This suggests an intricate linkage among education, wealth status, marriage, and childbearing. For example, adolescents from households in a lower wealth quintile usually have higher school dropout

rates. Such children often need to work or support families to address their financial burden and cannot continue their education. Because marriage is the main step adolescents need to take to complete their transition to adulthood once they finish school, the likelihood of marrying and having children while young is higher for those who leave school early.

Moreover, in the Madheshi community, early marriage is linked with dowry payment. Higher educational attainment for girls means more highly educated brides, hence higher dowry payments. Therefore, marrying a daughter off early is seen as a good way to incur lower dowry payments. Once a couple gets married, they feel the societal pressure to have children. Additionally, if they decide to delay childbearing, society may perceive them differently for not having children or perceive them as a couple with subfertility.

Recommendations: The National Adolescent Health and Development Strategy 2075 (2018) has set a strategy to discourage early marriage and childbirth among adolescents and mentions it as a key intervention area.²⁸ Policies and measures in this context should focus on postponing first childbirth until after age 20 years for married adolescents. The strategy suggests multisectoral interventions. At the local level, programs can be designed to use existing female community health volunteers to track newly married adolescents, counsel them to postpone childbearing, and refer them to health facilities for suitable family planning (FP) services. Proper coordination at the three government levels is required. Internet-based platforms can also be used to disseminate visual information, education, and communication materials on the unintended consequences of early childbirth. The materials should be in the local language, to increase awareness among all people and help them change behaviors accordingly. For this, the local government can take the lead, as per the needs at the local level.

4.2 Minimal Decline in Adolescent Marriage

The proportion of women age 20–24 who experienced their first marriage in adolescence declined significantly from 60% in 2011 to 54% in 2022. However, the results confirmed that adolescent marriage remains common in Nepal. Early marriage is a culturally rooted practice in Nepal, where the older generation typically prefers to see their grandchildren (especially their grandsons) as soon as possible, and where there is a perceived belief that late marriage leads to childlessness. Since early marriage is strongly associated with adolescent pregnancy and poor health outcomes for both adolescent women and their children, adolescent women in Nepal still face and likely to continue to face adverse consequences of early marriage.

Adolescent marriage was significantly associated with education and wealth quintile. A multicountry study in Nepal, India, Bangladesh, and Pakistan²⁹ found these same factors to be associated with adolescent marriage. A study from Indonesia also revealed similar results.³⁰ Recent data show that at least a secondary education is a necessary threshold for increasing age at marriage, and previous studies had similar findings.¹³ However, the association between education and early marriage is not straightforward. Education might be stopped due to early marriage, or age at marriage may increase due to continuing education. Comparing our results with those of previous studies^{13,27} shows that household wealth has become more strongly associated with lower adolescent marriage rates over time. Education-based and wealth-based inequalities in child marriage are quite evident in Nepal.¹² Adolescent girls with lower economic status generally face challenges in continuing their education. Their parents may not have sufficient resources and patience to invest in their children's education, expecting a return only after a long

time. Current economic hardship outweighs the long-term benefits of investing in education, leading to higher school dropout rates and a higher chance of marriage at very young ages. As a result, parents of lower economic status might feel that marrying their daughters off early will free them from burden.

Recommendations: Recommended policy measures include a multisectoral approach to intervention. Engagement of education, health, and finance ministries is expected. Federal and provincial policies for helping all adolescents continue education, convincing adolescents and their parents about the negative consequences of child marriage, and engaging out-of-school adolescents in income-generating activities aimed at reducing poverty can accelerate the rate of increase in age at marriage.

Programs should focus on keeping girls in school and on educating both girls and boys about the unintended consequences of early marriage. Schools can be used as a good platform. Although sexual and reproductive health education in school curricula theoretically aims to enhance students' understanding of the adverse effects of early marriage and childbirth, the question lies in whether the content is being effectively delivered and whether actual learning is achieved. Proper training for teachers should be ensured, and school nurses could also be made responsible for educating adolescents (both boys and girls) in this matter. The latter task could be performed with the aegis of local government.

Keeping adolescent girls and boys engaged in education can bring positive change by slowing the transition to adulthood. Increasing the “rewards” of education, such as creating employment opportunities linked to completion of secondary school, may encourage adolescents and their parents to delay marriage. Similarly, local-level income-generation programs focused on girls who leave school for various reasons can empower them and encourage self-dependence, hence promoting older age at marriage. Effectively instituting legal provisions regarding marriage and punishing violators is another possible strategy, in which a lead role could be played by the semilegal body (Nyaaik Samiti) led by the deputy chairperson of the local government. Moreover, using internet-based platforms to disseminate information, education, and communication materials that convey messages on the negative consequences of early marriage could help adolescents in the next generation better understand the matter and shape their behaviors accordingly. More effective advocacy for child rights and the participation of adolescents in decision-making on reproductive health issues is another local-level strategy that could help stop child marriage. The local government could also design and implement a long-term awareness program that reflects the existing social norms that contribute to child marriage.

4.3 Low Level of Modern Family Planning Use

The rate of FP use among married adolescents remains low, and we found only a slow incremental increase compared with increases observed in previous studies.^{13,27} The tendency to use FP only after having a child contributes to low FP use among married adolescents with no children. This might be due to social pressure to have a child soon after marriage, or to a prevailing misconception that FP use before childbirth may alter women's childbearing potential. Our finding of a higher unmet need for FP among adolescents who already have a child than among those who don't further supports this conclusion. Similarly, as previously mentioned, a substantial proportion (25%) of recent childbirths among adolescent mothers were unwanted,¹⁴ indicating that many married adolescents miss the opportunity to postpone childbirth by through proper use of FP methods. Although quite high, levels of unmet need for FP are unlikely to be driving adolescent pregnancy on their own.

Adolescent women who did not live with their husbands/partners were also less likely than their counterparts to use a modern FP method. They may have felt no need to use a FP method in their husband's or partner's absence. However, the absence of a current husband/partner is not a sufficient reason for nonuse, as adolescent women may resume sexual active when their husbands/partners return or visit; thus, this group of adolescents may have special FP needs.

Low uptake of modern FP methods among adolescents may be linked to supply-side factors. Although almost all health facilities in Nepal offer modern FP methods, only 45% offer adolescent-friendly services and only 14% of service providers are trained in adolescent sexual and reproductive health.³¹ Three temporary modern methods—oral contraceptive pills, male condoms, and injectables (e.g., Depo)—are offered in more than 95% of the health facilities. However, only 41% of health facilities are equipped to provide implants and only 29% to provide intrauterine devices. All seven modern contraceptive methods, including sterilization (both male and female), are available in only 38% of public health facilities managed by federal/provincial government hospitals and in only 8% of local-level hospitals.¹⁴

Poor linkage of service providers with prospective service seekers is another likely problem, as only 4% of adolescent women in the 2022 NDHS reported that they were visited by FP workers and discussed FP.¹⁴ The proportion of staff trained to provide FP services has decreased from 31% to 21% in Nepal; hence, lack of trained staff is one of the major barriers to quality service.¹⁴ Another problem may be the lack of trained personnel deployed in appropriate service delivery places. Poor service, in terms of the environment in which FP counseling occurs, was also indicated in the 2021 Nepal Facility Health Survey by the fact that auditory and visual privacy and confidentiality were maintained in only 12% of FP consultations.³¹ This situation may further obstruct the more vulnerable adolescent group from obtaining FP services, contributing to a low level of FP use.

Recommendations: To accelerate the rate of modern FP use among adolescents, service expansion in which trained staff offer the full range of modern FP methods to prospective users through adolescent-friendly service channels is necessary. As a first step, policy decisions should be made to recruit enough trained staff for FP service delivery in all service centers. Federal and provincial governments can also review the existing trained staff and determine whether they are appointed to appropriate service delivery points. The second step would be to improve the quality of FP services and make them more adolescent-friendly. The provincial government should invest in improving the infrastructure to ensure audio and visual privacy in counseling rooms and encourage health service providers to emphasize the importance of privacy and confidentiality for adolescents (and everyone else). Health service providers should also be trained in effective counseling skills to ensure that adolescents receive support and guidance during their health visits.

In some hierarchical mechanisms of modern FP service provision, local health workers and female community health volunteers can be assigned to track adolescents needing FP, counsel them, and guide them to the proper FP service points. This will require a well-functioning referral mechanism in the FP service network, which can be achieved by engaging all three levels of government. Only a few private health facilities currently record modern FP service client data and report on the integrated health information management system, implying a need for interventions to improve the recording and reporting system in private health facilities. Training private health service providers on accurate recordkeeping and timely data entry, establishing effective data management systems, and implementing regular monitoring and evaluation mechanisms can help address this issue. Local governments should create a capacity

development program for schoolteachers in health and physical education pedagogy to effectively deliver FP and reproductive health content to secondary students. This program should also strengthen the capacity of school nurses and raise awareness among adolescent girls to increase knowledge about the fertile period and the healthy timing and spacing of childbirth to reduce unwanted pregnancies. School-based interventions focused on social behavior change communication through different platforms, including the internet and social media, are also imperative for educating adolescents about FP and reproductive health.

4.4 High Adolescent Unmet Need

Although the demand for FP among married adolescents was as high as 59%, only 48% of the overall demand was satisfied, and use of modern FP methods was as low as 24%. Comparing these results with those of previous studies suggests that demand satisfaction through modern FP methods has remained persistently low among married adolescents.¹³ This is not surprising, as the level of use of modern methods is itself low. Although the unmet need for FP among married adolescents significantly declined from 42% in 2011 to 31% in 2022, it has remained high. In addition, unmet need for FP among married adolescent who already had at least one child did not significantly decline in the study period of 2011–2022.

The absence of a husband/partner from home partly explains the high unmet need among married adolescents. Our results show that if married adolescent women are not residing with their husbands/partners, they are more likely to have higher unmet need. However, this finding should be interpreted with caution. Unmet need among adolescents whose husbands/partners are living elsewhere may be overestimated because the algorithm for counting situations of unmet need assumes that all married women are sexually active and, hence, potentially at risk of pregnancy.²³ This assumption may not hold true for married women whose husbands/partners are not living at home, and it is also not correct to assume that such women do not need FP.¹³ The need for FP among these adolescent married women should be prioritized because they may have an urgent need for FP after their husbands/partners return home.³² The FP program should address this special need.

Recommendations: Policymakers should realize that the Public Health Service Act 2075 (2018) states that FP services (including abortion and reproductive health) are public health services, but that it does not specifically mention which modern FP methods fall under the basic health service bracket and which do not.³³ The practice is that temporary modern methods (i.e., oral contraceptive pills, male condoms, and injectables) are offered in almost all basic levels of health service mechanisms, but that individuals must be referred to or contact a higher-level health facility (i.e., primary health care center or provincial/federal government hospital) for long-acting modern methods or permanent methods. The Public Health Service Act 2075 also mentions the proper integration of basic health services into specialized services through a proper referral mechanism among the three layers of government institutions to effectively deliver public health services.³³ However, the linkage of local-level health facilities with higher-level health facilities seems weak, and the linkage among all levels of government needs to be strengthened to establish an effective referral mechanism and reduce unmet need.

4.5 Implications for Research, Policy, and Programs

Our results have some potential implications for research. First, in the context of high male migration for foreign employment, spousal separation contributes to fertility decline in Nepal.³⁴ One important research area to examine is the use of FP among adolescent women who are versus who are not living with their

husbands/partners. This has significant implications for understanding the drivers of contraceptive use and the levels of unmet need. Second, our analyses of trends in and determinants of outcome variables were conducted using national NDHS data. Future studies on trends in and patterns of adolescent marriage, pregnancy, FP use, and unmet need could be conducted among adolescent groups at the provincial level and within major socioeconomic strata. Third, we were unable to analyze determinants of abortion due to a very small sample of adolescents who reported having an abortion. Future studies could focus on the reasons behind abortion in adolescence in Nepal.

Our findings also have implications from the policy and program perspectives. The local government should enhance providers' technical knowledge on FP, informed choice counseling, and other reproductive health issues related to adolescents. This will help them communicate with adolescents and provide quality services that more effectively respond to their modern FP needs and reduce their unmet need. Given the slow decline in the proportion of women who marry in adolescence, the FP program could focus on strengthening the mechanism for tracking newly married adolescents and counseling them to postpone their first childbirth until the end of their adolescence by using a suitable FP method. Local health institutions, including female community health volunteers, can be assigned to track those in need, counsel them, and help them reach suitable health facilities through effective referral mechanisms. The FP program should focus on enhancing quality service through a rights-based approach with full information and method choice, especially related to reducing unmet need among less educated and poor married adolescents and those residing in urban areas and in Madhesh province.

Finally, other challenges of low uptake of FP among adolescents in Nepal are due to judgmental attitudes of service providers, suboptimal knowledge among service providers about the appropriateness of the range of FP methods for adolescents, cost factors in the private sector, confidentiality and privacy issues in the public sector, and limited coverage of sexuality education in school.^{35–38} Building the capacity of the local government is vital for expanding adolescent-friendly services and ensuring quality benchmarks.

4.6 Study Limitations

Throughout our study, background variables like education and wealth quintile represented respondents' situations at the time of the surveys; however, some of the outcomes were events that had occurred in the past. As a result, the direct associations we found may not have captured cause-effect relationships between variables, nor truly represented the situation at the actual survey times. However, for analyses, we intentionally used data from age groups (20–24 and 15–19) that were as close temporally to the study outcomes as possible.

5 CONCLUSION

5.1 Key Findings

- We found no statistically significant decline in adolescent childbirth in the past decade.
- Adolescent marriage declined significantly, but minimally, from 60% in 2011 to 54% in 2022.
- Education and wealth quintile had significant and inverse associations with both adolescent marriage and adolescent childbirth.
- Although unmet need for family planning (FP) among married adolescents declined significantly from 2011 to 2022, the decline was insignificant for the most recent period, 2016 to 2022.
- Number of living children and whether an adolescent woman's husband/partner was living at home were significantly associated with modern FP use and unmet need for FP among married adolescents. Having living children was associated with higher use of modern FP but also higher unmet need. Having a husband/partner living at home was associated with higher use of modern FP and lower unmet need.

5.2 Key Recommendations

In Nepal, the decline in childbearing during adolescence has not kept pace with the government's goal. This very slow decline in adolescent fertility is mainly associated with persistent early marriage patterns followed by social pressure to have a child soon after marriage, which leads to very low levels of FP use before having a child and higher unmet need after having a child (due to increased desire to control fertility having fulfilled the social obligation of having had children). Figure 8 describes recommendations at all three levels of government to facilitate notable decreases in adolescent marriage, childbirth, and unmet need for FP in Nepal. In summary:

- The government should focus on delaying marriage by implementing multisectoral interventions. Interventions to reduce poverty, keep girls in school, and make adolescents more aware of the unintended consequences of early marriage may be effective in delaying marriage until after adolescence. Promoting social awareness to change sociocultural norms/expectations about family formation can be an additional intervention.
- Interventions related to early childbearing can include policies and programs that encourage postponement of first childbirth through proper counseling and the use of FP.
- Expanding rights-based, adolescence-friendly FP services with a special focus on quality may promote modern FP use and reduce unmet need for FP among adolescents.
- Existing interventions and lessons learned from implementation, both in Nepal and elsewhere, should be reviewed when attempting to address adolescent marriage and childbirth.

Figure 8 Recommendations for federal, provincial, and local levels of government

Federal level	Provincial level	Local level
<ul style="list-style-type: none"> • Adopt a multisectoral approach and expand interventions, jointly with provincial and local governments, to meet its aim to end child marriage. • Assign the Ministry of Health and Population to take the lead in making all health facilities aware of the Adolescent Friendly Health Service Operation Guideline 2079 and implement it effectively across the nation. • Foster a collaborative environment with the Department of Health Services by scaling up the electronic logistics management information system, health facilities, and planning units at both federal and provincial levels. • Ensure essential data for prioritizing needs and allocating resources based on informed insights. 	<ul style="list-style-type: none"> • Formulate a long-term strategy for ending child marriage, including tailor-made actions to target the root causes of child marriage and social norms to reduce adolescent fertility. • Optimize adolescent health services so that specialized training sessions that align with national standards and are precisely tailored for adolescents can be conducted. • Comprehensively train health service providers to understand and adhere to operation guidelines, proficiently use job aids, and realize the importance of adolescent sensitization. 	<ul style="list-style-type: none"> • Design and implement a long-term awareness campaign of existing social norms contributing to adolescent marriage and childbirth and target appropriate communities. • Formulate a capacity development program for schoolteachers in health and physical education pedagogy to deliver family planning and reproductive health content for monitoring and supervision at school, identify school dropouts, and collaborate with others to run the special classes based on the condensed curriculum. • Re-enroll school dropouts in formal education by providing scholarship support up to the secondary level, along with livelihoods-related skills and income-generation activities. • Develop interventions to generate demand for family planning services among adolescents and improve referral mechanisms, particularly for long-acting reversible contraceptives. • Implement awareness campaigns, community outreach, and strengthening of linkages between service facilities and providers.

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APPENDIX

Table A1 Description of background variables used in analysis

Variable	Type	Description
Age	Numeric, measured in completed years	This was the current age in years of respondents at the time of the survey.
Place of residence	Categorical, nominal	Place of residence was categorized as Urban or Rural.
Province	Categorical, nominal	The seven provinces as per Nepalese constitution are Koshi, Madhesh, Bagmati, Gandaki, Lumbini, Karnali, and Sudurpaschim.
Caste/ethnicity	Categorical, nominal	This was obtained from the survey question on caste/ethnic affiliation and categorized as Brahmin, Chhetri, Terai/Madheshi, Dalit, Hill Janajati, Terai Janajati, Newar, Muslim, and Other.
Wealth quintile	Categorical, ordinal	This standard Demographic and Health Survey variable is widely used as a proxy for economic condition. The five ordinal categories corresponding to the quintiles of the de jure household population of sampled households were Lowest, Second, Middle, Fourth, and Highest.
Education	Categorical, ordinal	As per the current Nepalese education system, class 8 is the highest level for basic education, class 12 for secondary education, and university for higher education. In this report, education was divided into three ordinal categories: No education (uneducated), Basic education (completed any class 1–8), and Secondary (completed any class 9–12) or higher education. Only a small number of respondents were in the original higher education category; hence, secondary and higher education were combined into a single category.
Exposure to FP messages	Categorical, ordinal	This was constructed as a dichotomous variable based on Yes/No responses to eight questions related to exposure to FP messages in different media that were asked in the 2022 Nepal Demographic and Health Survey. ^a Those exposed to none of the eight items were considered to be in the “No exposure” or “No” category, and those exposed to at least one of the items were considered to be in the “Exposed” or “Yes” category.
Living with husband/partner	Categorical, nominal	This indicated whether a currently married adolescent woman lived with her husband/partner. “Yes” meant her husband/partner was living with her at the time of survey, and “No” meant her husband/partner was living elsewhere at the time of survey.
Number of living children	Categorical, ordinal	Although this was a numeric variable, it was converted into two categories: No living children and At least one living child.
Number of living sons	Categorical, ordinal	Although this was a numeric variable, it was converted into two categories: No living sons and At least one living son.
Ideal number of children	Categorical, ordinal	Although this was a numeric variable, it was converted into three categories: 0–1, 2, and 3+.
FP decisions	Categorical, nominal	This indicated women’s involvement in decisions of FP use. It was measured as a categorical variable with three categories: By self, Joint (with husband/partner), and By others.

FP = family planning

^a In the past 12 months have you: (1) Heard about FP on the radio? (2) Seen anything about FP on the TV? (3) Read about FP in a newspaper or magazine? (4) Received a voice or text message about FP on a mobile phone? (5) Seen anything about FP on social media such as Facebook, Twitter, or Instagram? (6) Seen anything about FP on a poster, leaflet, or brochure? (7) Seen anything about FP on an outdoor sign or billboard? (8) Heard anything about FP at community meetings or events?

Table A2 Determinants of adolescent marriage: odds ratios from four models of logistic regression among women age 20–24, 2022 Nepal DHS

Variable	UOR	95% CI	Model I		Model II		Model III		Model IV	
			AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
Caste/ethnicity										
Brahmin	2.19	0.73–6.62	1.83	0.61–5.55	1.57	0.52–4.68	2.09	0.70–6.25	1.54	0.51–4.63
Chhettri	5.03**	1.70–14.89	3.27*	1.11–9.61	2.10	0.70–6.27	4.43**	1.50–13.03	2.00	0.67–5.95
Terai/Madheshi	9.37***	3.10–28.32	3.63*	1.20–10.99	5.09**	1.68–15.36	8.67***	2.88–26.09	2.73	0.89–8.37
Dalit	10.63***	3.58–31.6	3.03*	1.02–8.99	3.94*	1.32–11.74	9.52***	3.22–28.14	1.88	0.62–5.63
Newar (Ref.)										
Hill Janajati	4.34**	1.51–12.41	2.11	0.74–6.03	1.84	0.65–5.26	3.74*	1.32–10.59	1.33	0.46–3.83
Terai Janajati	3.31*	1.11–9.93	1.32	0.43–4.02	1.45	0.48–4.40	2.93	0.98–8.78	0.86	0.28–2.66
Muslim	9.63***	3.01–30.81	1.15	0.34–3.87	5.44**	1.73–17.09	8.76***	2.76–27.85	1.00	0.30–3.34
Other	13.38	0.94–191.06	4.07	0.41–40.47	16.12*	1.10–235.39	12.40	0.88–175.24	4.99	0.60–41.56
Education										
No education (Ref.)										
Basic education	0.67	0.42–1.06	0.62	0.38–1.01					0.71	0.43–1.17
Secondary education	0.09***	0.05–0.14	0.08***	0.05–0.13					0.11***	0.07–0.19
Higher education	0.01***	0.01–0.03	0.01***	0.01–0.03					0.02***	0.01–0.06
Wealth quintile										
Lowest (Ref.)										
Second	0.72*	0.53–0.98			0.66*	0.49–0.91			0.82	0.58–1.15
Middle	0.5***	0.37–0.67			0.44***	0.32–0.59			0.63**	0.45–0.89
Fourth	0.33***	0.25–0.44			0.29***	0.22–0.4			0.54***	0.40–0.75
Highest	0.12***	0.08–0.17			0.12***	0.08–0.18			0.28***	0.19–0.42
Place of residence										
Urban (Ref.)										
Rural	1.75***	1.42–2.15					1.72***	1.39–2.14	1.12	0.90–1.39
Province										
Koshi	2.09***	1.46–2.99								
Madhesh	6.04***	3.91–9.32								
Bagmati (Ref.)										
Gandaki	1.22	0.73–2.04								
Lumbini	1.71**	1.15–2.55								
Karnali	3.41***	2.06–5.66								
Sudurpaschim	2.39***	1.56–3.66								
Constant			3.26*	1.02–10.46	1.18	0.40–3.48	0.21**	0.07–0.60	5.95**	1.79–19.74
Number of cases (unweighted)	2,623									

* $p < .05$, ** $p < .01$, *** $p < .001$

AOR = adjusted odds ratio; CI = confidence interval; Ref. = reference category; UOR = unadjusted odds ratio

Note: The final model (Model IV) did not include province, as it considered caste/ethnicity more important than province, and some ethnicities were clustered in a particular province.