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## Multilevel factors influencing contraceptive use and childbearing among adolescent girls in Bara district of Nepal: a qualitative study using the socio-ecological model

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## Multilevel factors influencing contraceptive use and childbearing among adolescent girls in Bara district of Nepal: a qualitative study using the socio-ecological model

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### ABSTRACT:

**Objectives:** This study aimed to identify the multilevel factors that influence contraceptive use and childbearing decisions in Nepal and examine relationships among these factors.

**Design:** The study drew on qualitative data collected through in-depth interviews (IDIs) and key informant interviews (KIIs) and triangulated results.

**Setting:** An urban municipality and a rural municipality in Bara district, Nepal.

**Participants:** We recruited a total of 60 participants (e.g., 20 married adolescent girls aged 15 to 19, 20 husbands, 20 mothers-in-law) for IDIs and 10 (e.g., four health care providers, four health coordinators, three female community health volunteers) for KIIs.

**Results:** Married adolescent girls faced a range of barriers that are interacted across different levels. Patriarchal norms and power imbalances between spouses limited their decision-making power regarding contraception. Social pressures to give birth soon after marriage drove the fear of infertility, abandonment, and the stigmatization of childless married couples, which leads to lack of women's autonomy in making decisions about family planning. Mothers-in-law and religion exerted considerable influence over couples' decisions regarding contraceptive use. Limited access to information about the benefits and methods of family planning contributed to fear of the side effects of contraceptives and low awareness about the risks involved in adolescent pregnancies.

**Conclusions:** The convergent results from triangulation confirm that the decision to postpone childbearing is not merely the personal choice of an individual or a couple, highlighting the importance of targeting families and communities. The study underscores the need to challenge restrictive socio-cultural norms so that adolescent girls are empowered to exercise greater control over contraceptive use.

### STRENGTHS AND LIMITATIONS OF THIS STUDY

- The present study is one of the first qualitative studies to identify the multilevel, interacting factors that influence contraceptive use and childbearing among married adolescent girls.
- The study extended the evidence base by illustrating the multidimensionality and

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6 48 interaction of the factors that limit women's family planning knowledge,  
7 49 undermine their autonomy in decision making, reduce contraceptive use, and  
8 50 increase the risk of adolescent pregnancy.

- 9 51 • Strengths of the study include a comprehensive approach guided by the socio-  
10 52 ecological model, and triangulation from a range of individuals and two data  
11 53 collection approaches.  
12 54 • Limitations of the study include a convenience sample from a single district, the  
13 55 possibility of feeling inhibited to candidly share their experiences and perspectives  
14 56 in the presence of an interviewer, and lack of respondent validation.  
15 56  
16 57

17 58 **Keywords:** Adolescents; contraceptive use; childbearing; qualitative study; socio-  
18 59 ecological model; Nepal

19 60  
20 61 **WORD COUNT**

21 62 5,039  
22 62  
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24 64

25 65 **INTRODUCTION**  
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27 67 Adolescent pregnancies and childbirths are a global concern. Each year, 21 million 15 to  
28 68 19-year-old girls in low- and middle-income countries (LMIC) become pregnant, of  
29 69 which 12 million girls give birth [1]. Births to adolescents of this age group account for  
30 70 11 % of all childbirths worldwide [2]. Approximately 5.6 million and 3 million  
31 71 pregnancies in the same population segment result in abortion and miscarriage,  
32 72 respectively. In LMIC, about half (49 %) of all pregnancies among 15 to 19-year-old girls  
33 73 are unintended, and more than half of them end in abortion or miscarriage [1]. Among  
34 74 adolescent girls who require family planning, 23 million have an unmet need for modern  
35 75 contraception [1]. Addressing this need might lower the rate of unintended pregnancies  
36 76 by six million annually [1].  
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40 78 Global and national policies often assume that the primary reason for contraceptive  
41 79 nonuse among adolescent girls is their personal choice (or the choice of couples).  
42 80 However, several other factors also prevent them from seeking family planning services  
43 81 and delaying childbearing in LMIC. Researchers have noted a number of barriers that  
44 82 hinder married adolescent girls from using contraceptive methods and postponing  
45 83 childbearing. These barriers can be classified into five categories: individual-level (e.g.,  
46 84 limited knowledge, the fear of adverse side effects) [3-7], partner-related (e.g., refusal to  
47 85 use contraceptives) [3, 4, 6], family-related (e.g., influence of mothers-in-law and sisters-  
48 86 in-law) [3, 6], social acceptability (e.g., community expectations to prove one's fertility)  
49 87 [6, 7], and service delivery-related factors (e.g., confidentiality and privacy issues) [8].  
50 88 However, a shortcoming of the previous qualitative research is narrow focuses on each  
51 89 level without examining interactions among factors at different levels. Few in-depth  
52 90 investigations have been conducted to promote the nuanced understanding of a complex  
53 91 interplay of multilayered barriers that hinder contraceptive use [9]. Therefore, it is  
54 92 necessary to identify a host of the factors that impede contraceptive use and promote early  
55 93 childbearing.  
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6 95 In Nepal, the adolescent birth rate remains high at 88 births per 1000 adolescent girls aged  
7 96 15 to 19 in 2016 [10], and this figure is the second-highest in South Asia after Bangladesh  
8 97 [11]. A national survey showed that 17 % of 15 to 19-year-old adolescent girls were  
9 98 pregnant in the same year [10]. Among Nepali adolescents, pregnancies are related to a  
10 99 lower economic status, membership to a disadvantaged ethnic group, and unemployment  
11 100 [12]. The prevalent practice of child marriage also contributes to the high rate of  
12 101 adolescent pregnancies and is associated with contraceptive nonuse before the first  
13 102 childbirth in Nepal [13], India [13, 14], and Bangladesh [15]. In a nationally  
14 103 representative survey, 40 % of 20 to 24-year-old Nepali women were married before the  
15 104 age of 18 [10]. About one in two married adolescent girls aged 15 to 19 years give birth  
16 105 to her first child before turning 20, typically soon after marriage [10]. Although the Nepali  
17 106 government and its development partners have taken efforts to improve access to family  
18 107 planning services and information, contraceptive use remains disproportionately low  
19 108 among adolescent girls. Only 15 % of married adolescent girls use contraceptive methods;  
20 109 in contrast, the corresponding figure is 41 % among adult women aged 20 or above [10].  
21 110 Therefore, this study aimed to identify the multilevel factors that influence contraceptive  
22 111 use and childbearing decisions in Nepal and to examine relationships among these factors.  
23 112

## 24 113 **METHODS**

### 25 114

### 26 115 **Study setting**

27 116  
28 117 We conducted this study in an urban municipality (Mahagadimai Nagarpalika) and a rural  
29 118 municipality (Prasauni Gaunpalika) in Bara district in Province 2 of Southern Nepal. The  
30 119 province has the highest child marriage prevalence rate (65 %) among women aged 20 to  
31 120 24 years in 2016 [10]. We purposively selected these two municipalities from five urban  
32 121 municipalities and nine rural municipalities based on consultation with respective  
33 122 municipality officials. Then, we randomly selected one ward out of nine wards in each  
34 123 selected municipality.  
35 124

36 125 Bara district is home to 108,655 households (i.e., an average of 6.33 people members per  
37 126 household) [16]. The most dominant religion is Hinduism, followed by Islam and  
38 127 Buddhism. The men who live in these areas were primarily farmers, laborers, and small-  
39 128 scale business owners or employees. Married women were mostly involved in household  
40 129 work and farming. Most households have electricity, but power outages are frequent. Few  
41 130 houses have a latrine [16]. Each municipality has at least one health post where only  
42 131 primary health care services are provided.  
43 132

### 44 133 **Study participants**

45 134  
46 135 This study relied on multiple sources to collect rich and diverse data and triangulated  
47 136 results. We recruited three different groups for in-depth interviews (IDIs) to cover a wide  
48 137 range of perspectives of household members. The first group was 15 to 19-year-old  
49 138 adolescent girls who had been married for at least six months and were living with their  
50 139 husbands (n=20) at the time of data collection. The second group was husbands of married  
51 140 adolescent girls (n=20). The last group was mothers-in-law of married adolescent girls  
52 141 (n=20). We did not match IDIs participants by family for recruitment or analysis. As a  
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6 142 complementary method, we also conducted key informant interviews (KIIs) with those  
7 143 who possessed first-hand knowledge about community perceptions of and barriers to  
8 144 adolescent pregnancies. Participants for KIIs were healthcare providers working in a  
9 145 government healthcare facility (n=4), health coordinators working in the district health  
10 146 office or municipality office (n=4), and female community health volunteers (FCHVs)  
11 147 working in the study areas (n=3). Table 1 shows the focuses of IDIs and KIIs.  
12 148

13  
14 149 We purposively recruited those who met the aforementioned inclusion criteria with the  
15 150 help of local research assistants (the details regarding the assistants are provided below).  
16 151 As sampling frames were not available in the study areas, we used convenience sampling  
17 152 (i.e., door-to-door visits) to recruit participants of the study. We included minors aged 15  
18 153 to 17 years for this study because they were disproportionately underserved by family  
19 154 planning programs in Nepal. Vulnerabilities that are specific to this age group may  
20 155 account for the lower uptake of family planning services. We did not consider birth  
21 156 history or contraceptive use history for recruitment.  
22 157

### 23 158 **Data collection**

24 159  
25 160 From July 5-15, 2019, we conducted semi-structured IDIs and KIIs, using topic guides.  
26 161 These interviews focused on the knowledge, attitudes, beliefs, perceptions, and  
27 162 experiences that pertain to contraceptive use and childbearing (Table 1). We adopted  
28 163 these data collection methods because they afford greater flexibility in navigating the  
29 164 interview and depth of exploration in qualitative research [17]. We developed the topic  
30 165 guides based on the socio-ecological model (SEM) [18], literature reviews, and the  
31 166 research team's field observations to include previously identified key issues. The SEM  
32 167 offers a theoretical framework that can be used to examine the multilevel, interacting  
33 168 factors determining health behaviors [19]. McLeroy et al. [18] identified five levels of  
34 169 influence that are specific to health behaviors: intrapersonal factors, interpersonal factors,  
35 170 community factors, institutional factors, and policy factors. Based on literature reviews,  
36 171 we developed a conceptual framework (Figure 1), which was adapted from the SEM. We  
37 172 developed and used a separate topic guide for each group. Prior to data collection, we  
38 173 pretested one of the topic guides on two married adolescent girls to determine the  
39 174 feasibility of this strategy and refine the questions. The topic guides in English are  
40 175 available as a supplementary (S1).  
41 176

42 177 Five Nepali research assistants (four women and one man) collected data. They speak the  
43 178 local language (i.e., Bhojpuri) and are experienced in qualitative research. We trained  
44 179 them for three days to avoid the biases that typically interfere with the collection of  
45 180 qualitative data (e.g., friendliness bias, social desirability, confirmation bias, question-  
46 181 order bias) and to address ethical considerations. All of the assistants have a bachelor's  
47 182 degree in public health or sociology. They conducted individual face-to-face IDIs and  
48 183 KIIs in a private space chosen by the participants and at a time convenient to them. The  
49 184 sex of the interviewer matched the sex of the participant. The interviewers established  
50 185 rapport with the participants before commencing the interviews. They began the interview  
51 186 with general questions and moved onto more specific questions, including open-ended  
52 187 questions about their experiences of and perceptions about contraceptive use. The  
53 188 interviews lasted for approximately one hour and were audio-recorded to help verify  
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6 189 descriptive data. The interviewers transcribed verbatim both the IDIs and KIIs within 24  
7 190 hours of each interview. Subsequently, the second author (NK) translated the transcribed  
8 191 interviews into English. The interviewers checked the translated text for errors and  
9 192 omissions (including context and content accuracy).  
10 193

## 11 194 **Data analysis**

12 195  
13 196 We analyzed the data using a directed approach to content analysis, which is described  
14 197 by Graneheim and Lundman [20] and Hsieh and Shannon [21], and in accordance with  
15 198 the conceptual framework. Two authors (KS and NK) read English transcripts several  
16 199 times to immerse into the data and gained a sense of the whole. We coded and analyzed  
17 200 the meaning units, which were embedded within the transcripts. We also highlighted all  
18 201 texts, which, on the first impression, appear to represent factors influencing contraceptive  
19 202 use and adolescent childbearing. The next step in the analysis was to code all highlighted  
20 203 passages using predetermined codes based on the conceptual framework (Figure 1). We  
21 204 gave new codes to any texts that could not be categorized with the initial coding scheme,  
22 205 and then reviewed and revised these codes during the entire coding process. When  
23 206 inconsistencies emerged, we further refined the codes through discussion until we reached  
24 207 consensus. We grouped emergent codes into categories, and further classified into themes  
25 208 in accordance with the conceptual framework: intrapersonal, interpersonal, community,  
26 209 organizational, and policy-level factors. We translated relevant participant quotations and  
27 210 used them to illustrate themes. We adopted various measures to ensure that the  
28 211 publication of these responses does not violate the code of confidentiality. For instance,  
29 212 we used unique reference numbers to protect the identity of the participants. Finally, we  
30 213 constructed linkages among emergent categories and themes through axial coding.  
31 214 Respondent validation could not be conducted due to logistical constraints, and lack of  
32 215 personal information of the respondents. We used NVivo 9 (QSR International,  
33 216 Cambridge, MA) to facilitate coding, organization, searching for meaning units  
34 217 embedded within the English transcripts, and systematically compare the emergent  
35 218 categories and themes both within and across the cases. The qualitative methods and  
36 219 reporting of results in the present study adhered to the Consolidated Criteria for Reporting  
37 220 Qualitative Research (COREQ) [22] and Standards for Reporting Qualitative Research  
38 221 [23]. We filled and provided the COREQ as a supplementary file (S2).  
39 222

## 40 223 **Strategies to deal with validity threats**

41 224  
42 225 We employed various strategies for establishing three types of threats to validity that are  
43 226 pertinent to qualitative research [24]. The measures taken to reduce threats to descriptive  
44 227 and interpretative validity included using verbatim transcripts of the interviews,  
45 228 presenting participant quotations without shortening, asking open-ended questions, peer  
46 229 debriefing, collecting and analyzing rich data, and providing the thick description of the  
47 230 setting, participants, and themes. The research design of triangulation from a range of  
48 231 individuals and two data collection approaches helped handle threats to both  
49 232 interpretative and theoretical validity.  
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## 51 234 **Ethical considerations**

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6 236 The present study was approved by the Research Ethics Committee of the Graduate  
7 237 School of Medicine, the University of Tokyo (2019030NI), and the Nepal Health  
8 238 Research Council (3001) in Kathmandu. We secured written informed consent from the  
9 239 participants after they were informed about the aim, objectives, and procedures of the  
10 240 study. For those who were younger than 18 years, we obtained written informed consent  
11 241 from their parents. If the parent was inaccessible, we obtained it from minor participants.  
12 242 Participation in the present study was voluntary, and the participants were free to skip  
13 243 interview questions or withdraw their participation at any time without penalty. They  
14 244 were not required to provide any personal information (e.g., name, address, phone  
15 245 number) during the interviews. We used unique reference numbers to protect the identity  
16 246 of the participants.  
17 247

### 18 248 **Patient and public involvement**

19 249  
20 250 Participants and the public were not involved in the study design or planning of the data  
21 251 analysis.  
22 252

## 23 253 **RESULTS**

### 24 254 25 253 **Participant characteristics**

26 254  
27 255 Table 2 summarizes participants' characteristics. The mean age of the participating  
28 256 adolescent girls was 17.8 years (interquartile range (IQR) 17.0 to 18.3). A majority of  
29 257 them were married before the age of 18. Approximately half of them had at least one  
30 258 child, and several others were pregnant. Almost all of them had become full-time  
31 259 housewives living with their in-laws after marriage. All the adolescent girls had already  
32 260 discontinued their education. The mean age of the husbands and mothers-in-law was 23.5  
33 261 (IQR 21.0 to 25.3) and 48.4 (IQR 41.5 to 52.3), respectively. More than a half of the  
34 262 participants for IDIs were Hindu. Most of the husbands were farmers or casual laborers.  
35 263 The mothers-in-law had limited educational attainment. As providing the demographic  
36 264 characteristics of the KII participants might allow for their identification, we did not  
37 265 include such information in this article.  
38 266  
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### 41 269 **Intrapersonal factors**

#### 42 270 43 271 ***Fear of and misconceptions about side effects on health***

44 272 Both the married adolescent girls and husbands considered their fear of the side effects  
45 273 of contraceptive methods to be a factor that influences their decisions about family  
46 274 planning. They were concerned that the use of such tools would adversely affect their  
47 275 physical health. They also held misconceptions about the side effects of contraceptives.  
48 276 The following characteristic responses illustrate this observation:  
49 277

50 278 *I have heard that if we use an implant, there will be a lot of bleeding. Pills will harm*  
51 279 *the body, and it will feel hot if you use them.* (Ref. #122, married adolescent girl, 18  
52 280 years)

53 281  
54 282 *There is a chance of becoming infertile if contraceptives are used for a long time.*

283 (Ref. #992, husband, 21 years)

284

285 ***Lack of access to information***

286 Several married adolescent girls were unaware that they could avail of family planning  
287 services free of charge at public healthcare facilities. All the three groups demonstrated  
288 poor knowledge about family planning services.

289

290 *I think there is a need for family planning services and information. However, no*  
291 *one provided us with such information about free family planning services.* (Ref.  
292 #630, married adolescent girl, 17 years)

293

294 ***Shyness and embarrassment***

295 Most of the married adolescent girls cited shyness and embarrassment as barriers that  
296 prevented them from discussing the timing of childbearing and contraceptive use with  
297 their husbands. Both the married adolescent girls and husbands were not inclined to seek  
298 family planning information and services, especially from healthcare providers of the  
299 opposite sex.

300

301 *I will feel very shy to ask about family planning methods. It was only a year of my*  
302 *marriage, and they [healthcare providers] told me not to use contraceptives. If I*  
303 *must ask anybody about it, I will feel very shy.* (Ref. #460, married adolescent girl,  
304 17 years)

305

306 ***Low awareness about the risks involved in adolescent or multiple pregnancies***

307 Low awareness and misinformation about the risks involved in adolescent childbearing  
308 emerged as a contributor to contraceptive nonuse. While only a few married adolescent  
309 girls were aware that adolescent pregnancy was associated with an increased risk of  
310 obstetric complications, several respondents had low levels of knowledge about the risk.

311

312 *If a woman gives birth before 18 years of age, she will suffer from weakness,*  
313 *stomachache, and vomiting and will not be able to work much and always feel*  
314 *sleepy.* (Ref. #122, married adolescent girl, 18 years)

315

316 ***Interpersonal factors***

317

318 ***Limited autonomy in making decisions about family planning***

319 The respondents were governed by strong cultural norms, which empower husbands to  
320 make all household decisions and disallow wives from making independent decisions.  
321 Such patriarchal values, wives' financial dependence, and power imbalances between  
322 spouses had restricted women's decisions about contraceptive use. A few married  
323 adolescent girls reported that their husbands had refused to access contraceptives. They  
324 also noted that defying their husband's decisions would lead to family feuds.

325

326 *If I use it [contraceptives] and if I start having its side effects, then my husband will*  
327 *scold me. That is why he takes all the decisions. He makes major decisions because*  
328 *he earns and governs the family.* (Ref. #122, married adolescent girl, 18 years)

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6 330 *In our community, men make all decisions. I want to use contraceptives, but he does*  
7 331 *not want me to. He does not agree on the use of contraceptives. According to him,*  
8 332 *it will harm my body. (Ref. #335, married adolescent girl, 17 years)*  
9 333

10 334 *We [young wives] must live on another person's income to live and have to do*  
11 335 *whatever the other person says. That is why we do not have the right to make*  
12 336 *decisions. (Ref. #460, married adolescent girl, 17 years)*  
13 337

### 338 ***Influence of mothers-in-law***

16 339 The mothers-in-law undermined their daughter-in-law's autonomy in making decisions  
17 340 about contraception. Most of the married adolescent girls reported that their mothers-in-  
18 341 law had pressurized them into not using contraceptives until they had an ideal number of  
19 342 children.  
20 343

21 344 *My mother-in-law influenced my decision. She has the right to make decisions*  
22 345 *regarding my contraceptive use and childbearing. (Ref. #241, married adolescent*  
23 346 *girl, 16 years)*  
24 347

### 26 348 ***Limited mobility***

27 349 Most of the Hindu and Muslim wives considered limited mobility to be a barrier that  
28 350 hindered them from accessing family planning information and services because their  
29 351 husbands and mothers-in-law restricted their rights to travel.  
30 352

31 353 *If I do not take permission to go out, there is a chance of fighting with my husband.*  
32 354 *(Ref. #241, married adolescent girl, 16 years)*  
33 355

34 356 *Women must seek permission to go out not only from their husbands but also from*  
35 357 *their parents-in-law and other elders in the family. Only a few disobey such norms*  
36 358 *and go to a health facility for service. Discrimination and violence against women*  
37 359 *are a common consequence if they disobey family norms. (Ref. #587, FCHV, 35*  
38 360 *years)*  
39 361

### 42 362 ***Community factors***

#### 45 364 ***Social pressure to give birth soon after marriage and fear of infertility***

46 365 Most of the married adolescent girls, husbands, and mothers-in-law cited the extreme  
47 366 pressures to give birth soon after marriage as a reason for contraceptive nonuse and  
48 367 adolescent pregnancy. The married adolescent girls noted that, if a woman does not give  
49 368 birth within the first three years of her marriage, others will make fun of the woman and  
50 369 gossip about her infertility. They were afraid of abandonment and the stigmatization of  
51 370 childless married couples. Their family and community members had intimidated them  
52 371 into becoming pregnant. The married adolescent girls believed that their communities  
53 372 expected them to deliver their first child within the first year of marriage. In contrast,  
54 373 most of the husbands believed their community members expected couples to have their  
55 374 first child between the second and fifth year of marriage.  
56 375

57 376 *My community believes that women should give birth in the first year of their*  
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6 377 *marriage. If they do not, people will start gossiping about their infertility. (Ref.*  
7 378 *#29, married adolescent girl, 19 years)*

8 379  
9 380 *If a couple does not have a child after 4-5 years of marriage, people have negative*  
10 381 *thoughts about it. They ask, “Why doesn’t she have a child?” [and] “Is she having*  
11 382 *a problem with her reproductive capacity?” If she does not have a child after 3 to*  
12 383 *4 years, parents will decide to arrange another marriage for the son. (Ref. #230,*  
13 384 *husband, 22 years)*

14 385  
15 386 Concerns about child health and development contribute to the pressures to which women  
16 387 are subjected.

17 388  
18 389 *They [my family] also think that giving birth soon after marriage will contribute to*  
19 390 *the early development of the baby. (Ref. #630, married adolescent girl, 17 years)*

20 391  
21 392 As illustrated by the following response provided by a mother-in-law, the fear of  
22 393 elopement can also exacerbate social pressures.

23 394  
24 395 *Community members think that getting pregnant soon after marriage is good as*  
25 396 *women cannot elope with another guy if they have a child. They can better take care*  
26 397 *of a child and give birth to a healthy baby. (Ref. #756, mother-in-law, 55 years)*

27 398  
28 399 ***Role of religious beliefs in contraceptive use***  
29 400 Religious beliefs were a major barrier that prevented Muslim women from seeking  
30 401 contraceptives. However, Hindu women did not share the same perspective.

31 402  
32 403 *Our religion [Islam] teaches that the use of contraceptives is a sinful act. (Ref.*  
33 404 *#930, married adolescent girl, 19 years)*

34 405  
35 406 *In Islam, we believe that if we use contraceptives, God becomes unhappy and*  
36 407 *punishes us. (Ref. #241, married adolescent girl, 16 years)*

37 408  
38 409 ***Lack of engagement with FCHVs***  
39 410 FCHVs, who are responsible to disseminate reproductive health information, conduct  
40 411 family planning counseling and distribute condoms and oral pills in their communities,  
41 412 did not actively engage with married adolescent girls and involve them in family planning  
42 413 activities. Women’s restricted mobility impeded their access to FCHVs and opportunities  
43 414 to learn about contraceptive methods.

44 415  
45 416 *I never met a female health volunteer since I never go out of my home. I do not think*  
46 417 *there is a discussion about this [family planning issues] in our community. (Ref.*  
47 418 *#892, married adolescent girl, 18 years)*

48 419  
49 420 *I know that there are mothers’ group meetings regularly in this municipality, but I*  
50 421 *haven’t noticed or heard that FCHVs discuss with young couples about family*  
51 422 *planning issues. (Ref. #352, mother-in-law, 48 years)*

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## Organizational factors

### *Lack of privacy and confidentiality*

A few of the husbands and healthcare providers reported that concerns about confidentiality deterred married couples from visiting healthcare facilities to obtain contraceptives.

*Confidentiality is not maintained in some private clinics because my single friend went to a private clinic to buy condoms, and, later, this information was spread among their professional network. (Ref. #992, husband, 21 years)*

*Couples themselves do not feel comfortable going to government health facilities owing to a lack of privacy and confidentiality. This is because there is no separate space for family planning counseling and services in health facilities. (Ref. #729, health care provider, 31 years)*

### *Attitudes of healthcare providers*

A few of the married adolescent girls complained about the attitudes of healthcare providers.

*When seeking antenatal check-up during my pregnancy at a private clinic, the staff members were not friendly to me. They spoke only to my husband and asked him about my problem. (Ref. #335, married adolescent girl, 17 years)*

Healthcare providers reported other health systems-related barriers that prevented them from accessing family planning services, including (i) stockouts of contraceptives at healthcare facilities, (ii) the unavailability of female health workers who could provide family planning counseling and services to female clients, and (iii) overlap between the working hours (10 am to 3 pm) of healthcare facilities and the time at which the housewives tended to be busy with their household duties.

## Policy-level factors

None of the participants reported policy-level factors.

## DISCUSSION

This study is one of the first qualitative studies to identify the multilevel, interacting factors that influence contraceptive use and childbearing among married adolescent girls. It extends the evidence base by illustrating the multidimensionality and interaction of the factors that limit young married women's family planning knowledge, undermine their autonomy in decision making, reduce contraceptive use, and increase the risk of adolescent pregnancy. The barriers were intertwined and influenced each other across different levels of the SEM (Figure 2). The barriers were identified across the intrapersonal, interpersonal, community, and organizational levels. Barriers at the intrapersonal level were reluctance to seek family planning information and services, the fear of and misconceptions about side effects of contraceptives, low awareness

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5 471 about the risks involved in adolescent pregnancies, and a lack of access to information.  
6 472 Barriers at the interpersonal level were limited autonomy in making decisions about  
7 473 family planning, restricted mobility, power imbalances between spouses, and mothers-  
8 474 in-law's influence. Barriers at the community level were the fear of infertility and  
9 475 abandonment, the stigmatization of childless married couples, normative gender roles,  
10 476 and social pressures to give birth soon after marriage, which emerged as root causes of  
11 477 contraceptive nonuse. Barriers at the organizational level were a lack of privacy and  
12 478 confidentiality, and the unfriendliness of healthcare providers. The hypothetical  
13 479 relationships in Figure 2 are depicted based on the findings from the present study.  
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17 481 The women who participated in this study were not empowered to make independent  
18 482 decisions about contraceptive use. Their husbands and mothers-in-law were deeply  
19 483 involved in this decision-making process. Adolescent married girls, their husbands, and  
20 484 mothers-in-law keenly felt the pressure to bear a child within the first few years of  
21 485 marriage. None of the participating husbands and in-laws supported the idea of delaying  
22 486 the first pregnancy. Disapproval of contraceptive use before having an ideal number of  
23 487 children in the family was prevalent among them. Newly married adolescent girls had  
24 488 often become pregnant before they were ready to fulfill familial expectations to bear a  
25 489 child and prove their fertility. Patriarchal norms and power imbalances between spouses  
26 490 made married adolescent girls hesitate or refrain from talking to their husbands about  
27 491 family planning and limited their decision-making power regarding contraception. The  
28 492 present findings corroborate with previous studies that have found social pressures to  
29 493 give birth soon after marriage in India [3, 5], Bangladesh [6, 7], and Iran [25] and  
30 494 limited autonomy in making decisions about family planning in Nepal [9], Bangladesh  
31 495 [6], and Iran [25] and among Syrian refugees in Lebanon [4].  
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35 497 The married adolescent girls felt insecure, presumably because newly married women  
36 498 are not considered to be a valuable member of their in-law's family until they prove  
37 499 their fertility. Similar to the findings of previous studies in Iran [25] and Bangladesh  
38 500 [7], delivering a healthy child soon after marriage was perceived as a means to  
39 501 establishing her identity and consolidating her position within her husband's family.  
40 502 Additionally, labor migration to India, Malaysia, and the Middle East was common in  
41 503 the study areas. As such, having a child may be perceived as a way to cement the bond  
42 504 between a husband and his wife before his departure [7].  
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46 506 The mothers-in-law exerted considerable influence over couples' decisions regarding  
47 507 contraceptive use as they were perceived as the most experienced household member in  
48 508 relation to family planning. Their pressure on daughters-in-law to prove fertility within  
49 509 the first few years of marriage was identified as a strong reason for contraceptive  
50 510 nonuse. Given the restricted mobility of married adolescent girls, mothers-in-law and  
51 511 sisters-in-law were their primary sources of information about contraception. Similar  
52 512 findings regarding the influence of mothers-in-law have been identified in Nepal [9],  
53 513 Bangladesh [6], and Lao People's Democratic Republic [8].  
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56 515 Social pressures to give birth soon after marriage, normative gender roles, and religious  
57 516 beliefs emerged as the root causes of contraceptive nonuse. Social pressures to have a  
58 517 child soon after marriage drove the fear of infertility, abandonment, and the  
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5 518 stigmatization of childless married couples, which impeded the married adolescent  
6 519 girls' access to family planning services. Mothers-in-law may amplify the social  
7 520 pressure to have a child soon after marriage. Normative gender roles were related to  
8 521 restricted mobility among married adolescent girls. Furthermore, religious beliefs  
9 522 substantially limited their autonomy in making decisions about contraceptive use. This  
10 523 finding of religious restrictions is in agreement with a previous study in Bangladesh [6].  
11 524 In contrast, in another study conducted in Syria, religious beliefs did not emerge as a  
12 525 barrier to reproductive decisions [26].  
13 526

14 527 Limited access to information about the benefits and methods of family planning had  
15 528 multiple intrapersonal-level effects. It contributed to fear of and misconception about  
16 529 the side effects of contraceptives. It also led to low awareness about the risks involved  
17 530 in adolescent pregnancies. Some married adolescent girls were unaware of the free  
18 531 family planning services, which were provided at government healthcare facilities. Fear  
19 532 of the side effects has been recognized as a barrier to contraceptive use in India [3],  
20 533 Bangladesh [6, 7, 27], and Iran [25]. Dropping out of school may have limited their  
21 534 opportunities to learn about sexual and reproductive health issues and expand their  
22 535 social networks. The findings of this study support existing evidence that shyness in  
23 536 discussing family planning with husbands and healthcare providers impedes access to  
24 537 family planning services in Asian countries [3, 6, 8, 28].  
25 538

26 539 In addition to the intrapersonal-level factors, supply-side barriers (e.g., a lack of privacy  
27 540 and confidentiality, the unfriendliness of healthcare providers) may have rendered them  
28 541 reluctant to seek contraceptives. Issues related to commodity insecurity, distance, and  
29 542 transport did not seem to influence contraceptives-seeking behaviors. Health systems-  
30 543 level factors (e.g., a lack of privacy and confidentiality, the unfriendliness of health care  
31 544 providers) have been found to be contributing factors for contraceptive nonuse among  
32 545 married adolescent girls in Lao People's Democratic Republic [8].  
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34 547 The convergent results from triangulation across multiple sources (i.e., six different  
35 548 groups) and two data collection methods painted a complex and comprehensive portrait  
36 549 of the barriers to contraceptive use and causes of adolescent childbearing. However, the  
37 550 findings should be interpreted within the confines of several limitations of this study.  
38 551 First, a convenience sample was recruited from a single district in Nepal. Therefore, the  
39 552 findings may not be transferable to broader populations. Second, the participants may  
40 553 have felt inhibited to candidly share their experiences and perspectives, especially those  
41 554 that pertain to sensitive subjects, in the presence of an interviewer. For example, they  
42 555 may have felt uncomfortable reporting other prevalent, albeit extremely stigmatized  
43 556 experiences (e.g., abuse and neglect) that influence contraceptive use. In the present  
44 557 study, efforts were made to obtain in-depth data by interviewing in a private space,  
45 558 establishing rapport with the participants, and maintaining confidentiality. Third, due to  
46 559 lack of respondent validation, the possibility of misinterpreting the meaning of what the  
47 560 respondent says could not be ruled out. Fourth, the relationships shown in Figure 2 are  
48 561 intended to be an illustrative set of relationships, rather than an exhaustive set. Minor  
49 562 linkages are not necessarily reflected in the diagram. Finally, the meanings embedded  
50 563 within participants' responses might have been lost or distorted during translation from  
51 564 Nepali to English. To minimize this problem, the interviewers checked the accuracy of  
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6 565 the translated texts for errors and omissions. Despite these limitations, the strengths of  
7 566 this study include its comprehensive approach guided by the SEM, triangulation across  
8 567 multiple sources and methods, which enabled the collection of rich and detailed data,  
9 568 and other strategies for establishing validity.  
10 569

## 11 570 **CONCLUSIONS AND PROGRAMMATIC IMPLICATIONS**

12 571  
13 572 The present findings delineate the mechanism of contraceptive nonuse and adolescent  
14 573 pregnancy in the study setting. The rich qualitative data confirm that the decision to  
15 574 postpone childbearing is not merely the personal choice of an individual or a couple,  
16 575 highlighting the importance of targeting families and communities in addition to  
17 576 adolescent girls and couples. Expanding access to comprehensive sexuality education to  
18 577 enhance girls' knowledge and demand for sexual and reproductive health may not be  
19 578 enough to prevent adolescent pregnancy. Instead, the present findings underscore the  
20 579 need to challenge restrictive socio-cultural norms so that adolescent girls are  
21 580 empowered to exercise greater control over contraceptive use. Community support and  
22 581 collective actions are needed to address the root causes that have been identified in this  
23 582 study. Reproductive health programs and interventions should be culturally sensitive  
24 583 and context-specific and aim to reinforce women's reproductive rights and gender  
25 584 equality.  
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## 27 586 **REFERENCES**

- 28 587 1. The Guttmacher Institute. Adding it up: costs and benefits of meeting the  
29 588 contraceptive needs of adolescents. New York: The Guttmacher Institute; 2016.  
30 589 2. World Health Organization. Why is giving special attention to adolescents  
31 590 important for achieving Millennium Development Goal 5? Geneva: World Health  
32 591 Organization; 2008.  
33 592 3. Ghule M, Raj A, Palaye P, Dasgupta A, Nair S, Saggurti N, et al. Barriers to use  
34 593 contraceptive methods among rural young married couples in Maharashtra, India:  
35 594 qualitative findings. *Asian J Res Soc Sci Humanit.* 2015;5(6):18-33.  
36 595 4. Cherri Z, Gil Cuesta J, Rodriguez-Llanes JM, Guha-Sapir D. Early marriage and  
37 596 barriers to contraception among Syrian refugee women in Lebanon: a qualitative study. *Int*  
38 597 *J Environ Res Public Health.* 2017;14(8):836.  
39 598 5. McClendon KA, McDougal L, Ayyaluru S, Belayneh Y, Sinha A, Silverman JG, et  
40 599 al. Intersections of girl child marriage and family planning beliefs and use: qualitative  
41 600 findings from Ethiopia and India. *Cult Health Sex.* 2018;20(7):799-814.  
42 601 6. Shahabuddin AS, Nostlinger C, Delvaux T, Sarker M, Bardaji A, Brouwere VD, et  
43 602 al. What influences adolescent girls' decision-making regarding contraceptive methods use  
44 603 and childbearing? A qualitative exploratory study in Rangpur District, Bangladesh. *PLoS*  
45 604 *One.* 2016;11(6):e0157664.  
46 605 7. Henry EG, Lehnertz NB, Alam A, Ali NA, Williams EK, Rahman SM, et al.



- 1  
2  
3  
4  
5  
6 606 Sociocultural factors perpetuating the practices of early marriage and childbirth in Sylhet  
7 607 District, Bangladesh. *Int Health*. 2015;7(3):212-7.
- 8  
9 608 8. Sychareun V, Vongxay V, Houaboun S, Thammavongsa V, Phummavongsa P,  
10 609 Chaleunvong K, et al. Determinants of adolescent pregnancy and access to reproductive and  
11 610 sexual health services for married and unmarried adolescents in rural Lao PDR: a qualitative  
12 611 study. *BMC Pregnancy Childbirth*. 2018;18(1):219.
- 13  
14 612 9. Maharjan B, Rishal P, Svanemyr J. Factors influencing the use of reproductive  
15 613 health care services among married adolescent girls in Dang District, Nepal: a qualitative  
16 614 study. *BMC Pregnancy Childbirth*. 2019;19(1):152.
- 17  
18 615 10. Ministry of Health (Nepal), New ERA, Micro International Inc. Nepal Demographic  
19 616 and Health Survey 2016. Kathmandu, Nepal: Ministry of Health, Nepal; 2017.
- 20  
21 617 11. United Nations Department of Economic and Social Affairs. World Fertility  
22 618 20192020 18 April 2020. Available from:  
23 619 [https://www.un.org/en/development/desa/population/publications/pdf/fertility/World\\_Fertility\\_2019.pdf](https://www.un.org/en/development/desa/population/publications/pdf/fertility/World_Fertility_2019.pdf).  
24 620
- 25  
26 621 12. Poudel S, Upadhaya N, Khatri RB, Ghimire PR. Trends and factors associated with  
27 622 pregnancies among adolescent women in Nepal: pooled analysis of Nepal Demographic and  
28 623 Health Surveys (2006, 2011 and 2016). *PLoS One*. 2018;13(8):e0202107.
- 29  
30 624 13. Godha D, Hotchkiss DR, Gage AJ. Association between child marriage and  
31 625 reproductive health outcomes and service utilization: a multi-country study from South Asia.  
32 626 *J Adolesc Health*. 2013;52(5):552-8.
- 33  
34 627 14. Raj A, Saggurthi N, Balaiah D, Silverman JG. Prevalence of child marriage and its  
35 628 effect on fertility and fertility-control outcomes of young women in India: a cross-sectional,  
36 629 observational study. *Lancet*. 2009;373(9678):1883-9.
- 37  
38 630 15. Kamal SMM. Decline in child marriage and changes in its effect on reproductive  
39 631 outcomes in Bangladesh. *J Health Popul Nutr*. 2012;30(3):317-30.
- 40  
41 632 16. Central Bureau of Statistics (Nepal). National Population and Housing Census 2011.  
42 633 Kathmandu, Nepal: 2012.
- 43  
44 634 17. Marshall C, Rossman GB. Designing qualitative research. California, USA: SAGE  
45 635 Publications; 2014.
- 46  
47 636 18. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health  
48 637 promotion programs. *Health Educ Q*. 1988;15(4):351-77.
- 49  
50 638 19. Sallis JF, Owen N, Fisher EB. Ecological models of health behavior. In: Glanz K,  
51 639 Rimer BK, Viswanath K, editors. *Health Behavior and Health Education: Theory, Research,*  
52 640 *and Practice*. San Francisco, CA: Jossey-Bass; 2008. p. 465-85.
- 53  
54 641 20. Graneheim UH, Lundman B. Qualitative content analysis in nursing research:

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2  
3  
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5  
6 642 concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today*.  
7 643 2004;24(2):105-12.
- 8  
9 644 21. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual*  
10 645 *Health Res*. 2005;15(9):1277-88.
- 11  
12 646 22. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative  
13 647 research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health*  
14 648 *Care*. 2007;19(6):349-57.
- 15  
16 649 23. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting  
17 650 qualitative research: a synthesis of recommendations. *Acad Med*. 2014;89(9):1245-51.
- 18  
19 651 24. Maxwell JA. *A realist approach for qualitative research*. Thousand Oaks, CA: SAGE  
20 652 Publications, Inc.; 2012.
- 21  
22 653 25. Mardi A, Ebadi A, Shahbazi S, Esmaelzade Saeieh S, Behboodi Moghadam Z.  
23 654 Factors influencing the use of contraceptives through the lens of teenage women: a  
24 655 qualitative study in Iran. *BMC Public Health*. 2018;18(1):202.
- 25  
26 656 26. Hessini L. Abortion and Islam: policies and practice in the Middle East and North  
27 657 Africa. *Reprod Health Matters*. 2007;15(29):75-84.
- 28  
29 658 27. Schuler SR, Bates LM, Islam F, Islam MK. The timing of marriage and childbearing  
30 659 among rural families in Bangladesh: choosing between competing risks. *Soc Sci Med*.  
31 660 2006;62(11):2826-37.
- 32  
33 661 28. Barua A, Kurz K. Reproductive health-seeking by married adolescent girls in  
34 662 Maharashtra, India. *Reprod Health Matters*. 2001;9(17):53-62.

### 663 664 665 **Abbreviations**

666 COREQ: criteria for reporting qualitative research; FCHVs: female community health  
667 volunteers; FP: family planning; IDIs: in-depth interviews; IQR: interquartile range; KIIs:  
668 key informant interviews; LMIC: low- and middle-income countries; SEM: socio-  
669 ecological model

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### 681 682 **Consent for publication**

1  
2  
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4  
5 683 Not applicable.  
6  
7 684

8 685 **Conflicts of interests**

9 686 The authors declare that they have no competing interests.  
10 687

11 688 **Data Availability Statement**

12 689 The data generated during the present study are not publicly available due to restrictions  
13 690 (e.g., their containing information that could compromise the privacy of research  
14 691 participants) but are available from the corresponding author on reasonable request.  
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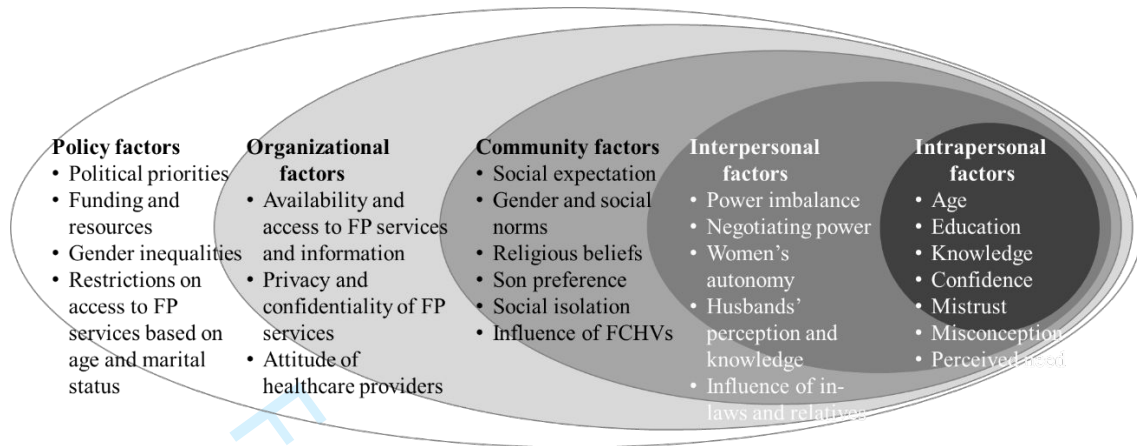
16 693 **Authors' contributions**

17 694 KS conceived and designed the study, analyzed the data, and wrote the draft manuscript.  
18 695 NJ jointly analyzed the data. NK, RCC, KO, AT, and MJ contributed to interpretation of  
19 696 the results and made critical suggestions for revisions to the manuscript. MJ supervised  
20 697 the study. All authors read and approved the final manuscript.  
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**Table 1.** Focuses of IDIs and KIIs

Type of participants	Focuses of IDIs and KIIs
Married adolescent girls	Knowledge about and access to FP information and services, perceived needs, decision-making power, influences of in-laws, social and gender norms, religious beliefs, privacy and confidentiality, attitude of healthcare providers, policy restrictions, and political priorities
Husbands	Knowledge about and access to FP information and services, perceived needs, decision-making power, influences of in-laws, social and gender norms, religious beliefs, privacy and confidentiality, attitude of healthcare providers, policy restrictions, and political priorities
Mothers-in-law	Knowledge about and access to FP information and services, perceived needs, decision-making power, influences of in-laws, social and gender norms, and religious beliefs
Healthcare providers/health coordinators/FCHVs	Access to FP information and services, social and gender norms, religious beliefs, challenges in providing FP services, policy restrictions, and political priorities

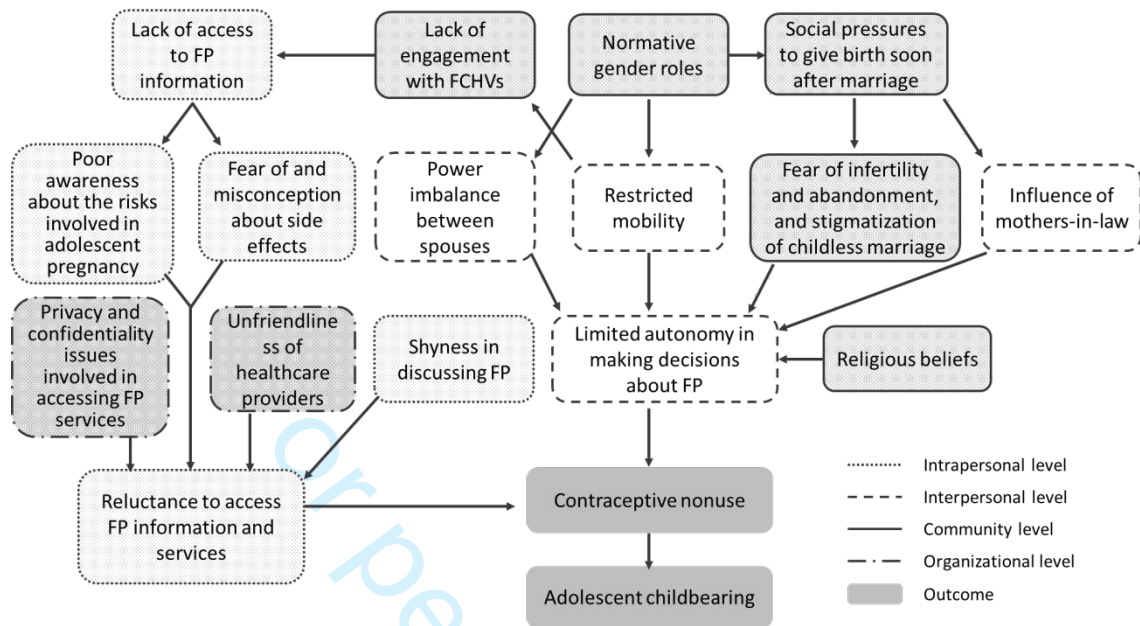
IDIs: in-depth interviews; KII: key informant interviews; FP: family planning; FCHVs: female community health volunteers



**Figure 1.** Conceptual framework adapted from on the socio-ecological model to identify the causes of contraceptive nonuse and adolescent pregnancy

Note: adapted from McLeroy et al. (1988) [18]

FP: family planning; FCHVs: female community health volunteers



**Figure 2.** A diagram of hypothetical relationships among the emergent factors

Table 2. Demographic characteristics of the participants for in-depth interviews

	Married adolescent girls (n=20)		Husbands (n=20)		Mothers-in-law (n=20)			
	Mahaga dimai	Prasauni	Mahagad imai	Prasauni	Mahaga dimai	Prasauni		
<b>Age (years)</b>			<b>Age (years)</b>		<b>Age (years)</b>			
15–17	1	5	15–19	3	0	30–39	2	0
18–19	9	5	20–24	3	8	40–49	4	5
<b>Age at marriage (years)</b>			25–29	2	3	50–59	3	3
12–14	3	3	30–34	1	0	60–69	1	2
15–17	5	7	<b>Religion</b>			<b>Religion</b>		
18–19	2	0	Hinduism	6	6	Hinduism	6	7
<b>Religion</b>			Islam	3	5	Islam	4	3
Hinduism	6	7	<b>Ethnicity</b>			<b>Ethnicity</b>		
Islam	4	3	Madhesi	1	2	Madhesi	4	4
<b>Ethnicity</b>			Muslim	3	5	Muslim	4	3
Madhesi	4	0	Terai Dalit	5	4	Terai Dalit	2	3
Muslim	4	4	<b>Educational level</b>			<b>Educational level</b>		
Terai Dalit	1	5	No education or some level of primary education	1	0	No education or some level of primary education	9	10
Teli	1	0	Completed primary school	1	2	Completed primary school	1	0
Unknown	0	1	Some level of secondary education	3	6	<b>Occupation</b>		
<b>Educational attainment</b>			Completed secondary school	0	0	Unemployed	2	4
No education or some level of primary education	4	4	Higher education	4	3	Farmer	3	6
Completed primary school	1	3	<b>Occupation</b>			Laborer	3	0
Some level of secondary education	2	3	Farmer	4	0	Community health volunteer	1	0

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4	Completed secondary	1	0	Laborer	3	4	Businessperson	1
5	school							0
6	Higher education	2	0	Businessperson	2	4		
7	<b>Occupation</b>			Teacher	0	1		
8	Unemployed	10	9	Helper	0	1		
9	Tailor	0	1	Tailor	0	1		
10								
11	<b>Number of children</b>							
12	0	3	8					
13	1	4	2					
14	2	3	0					
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## S1 Topic guides (English)

### Topic Guide for Married Adolescent Girls

<b>Intrapersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you know that free family planning services are available in your municipality?</li> <li>• Do you know where to access free family planning services?</li> <li>• Which contraceptive methods do you know?</li> <li>• How do you perceive family planning services?</li> <li>• Have you ever used any contraceptive method?</li> <li>• Do you perceive the need for family planning services and information?</li> <li>• Do you feel shy to seek family planning services and information?</li> <li>• What challenges do you face in seeking family planning services?</li> <li>• Do you fear side effects of contraceptive use?</li> </ul>
<b>Interpersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you discuss with your husband when to have a child and how many children to have?</li> <li>• Do you feel comfortable to negotiate contraceptive use with your husband?</li> <li>• Who has the power to make decision regarding whether to use contraceptives?</li> <li>• Does your husband agree or disagree to use contraceptives?</li> <li>• Do you have a final say on contraceptive use?</li> <li>• Do you perceive that there is power imbalance in terms of decision-making regarding family planning between you and your husband?</li> <li>• Do your mother-in-law or sisters-in-law influence your decision-making about contraceptive use?</li> <li>• Have you heard of your mother-in-law's or sisters-in-law's experience of using family planning services?</li> </ul>
<b>Community factors</b>	<ul style="list-style-type: none"> <li>• Is there social consensus in your community that women should become pregnant soon after marriage?</li> <li>• Did you feel pressure to become pregnant soon after marriage? If so, who did you feel pressure from?</li> <li>• Has your religion something to do with non-use of contraceptives after marriage?</li> <li>• Do you sometimes exchange information about family planning with your friends?</li> <li>• Do FCHVs in this municipality discuss family planning services with young women like you?</li> </ul>
<b>Organizational factors</b>	<ul style="list-style-type: none"> <li>• Are local health care providers supportive of providing contraceptives to young women like you?</li> <li>• Are they friendly to young women like you?</li> <li>• Do you feel your privacy and confidentiality are maintained at a nearby health facility?</li> <li>• How long does it take to get to a nearby health facility providing family planning services?</li> </ul>

	<ul style="list-style-type: none"><li>• Is there local transportation available to get to a nearby health facility providing family planning services?</li><li>• Would you need a permission from your husband if you go out to a health facility?</li></ul>
<b>Policy factors</b>	<ul style="list-style-type: none"><li>• Is there any restriction of family planning services on age?</li><li>• Is there any restriction of family planning services on marital status?</li></ul>

For peer review only

## Topic Guide for Husbands of Married Adolescent Girls

<b>Intrapersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you know that free family planning services are available in your municipality?</li> <li>• Do you know where to access free family planning services?</li> <li>• Which contraceptive methods do you know?</li> <li>• How do they perceive family planning services?</li> <li>• Do you perceive the need for family planning services and information?</li> <li>• Do you feel shy to seek family planning commodity (condom) and information?</li> <li>• What challenges do you face in seeking family planning services?</li> <li>• Do you fear side effects of contraceptive use?</li> </ul>
<b>Interpersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you discuss with your wife when to have a child and how many children to have?</li> <li>• Do you feel comfortable to discuss contraceptive use with your wife?</li> <li>• Who has the power to make decision regarding whether to use contraceptives?</li> <li>• Do you have a final say on contraceptive use?</li> <li>• Do you perceive that there is power imbalance between you and your wife?</li> <li>• Do your parents or anyone else influence your decision-making about contraceptive use?</li> <li>• Have you heard of anyone's experience of using family planning services?</li> </ul>
<b>Community factors</b>	<ul style="list-style-type: none"> <li>• Is there social consensus in your community that women should become pregnant soon after marriage?</li> <li>• Did you feel pressure to get your wife pregnant soon after marriage? If so, who did you feel pressure from?</li> <li>• Has your religion something to do with non-use of contraceptives after marriage?</li> <li>• Do you sometimes exchange information about family planning with your friends?</li> <li>• Do FCHVs in this municipality discuss family planning services with men like you?</li> </ul>
<b>Organizational factors</b>	<ul style="list-style-type: none"> <li>• Are local health care providers supportive of providing condoms?</li> <li>• Are they friendly to you when you go there to seek condoms?</li> <li>• Do you feel your privacy and confidentiality are maintained at a nearby health facility?</li> <li>• How long does it take to get to a nearby health facility providing condoms?</li> <li>• Is there local transportation available to get to a nearby health facility providing family planning services?</li> </ul>

## Topic Guide for Mothers-in-law of Married Adolescent Girls

<b>Intrapersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you know that free family planning services are available in your municipality?</li> <li>• Do you know where to access free family planning services?</li> <li>• Which contraceptive methods do you know?</li> <li>• How do they perceive family planning services?</li> <li>• What challenges do you think young couples face in seeking family planning services?</li> </ul>
<b>Interpersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you think your daughter-in-law should discuss family planning with her husband?</li> <li>• Did you feel comfortable to negotiate contraceptive use with your husband?</li> <li>• In your opinion, who should decide when to have a child and how many children to have</li> <li>• In your opinion, who should decide whether to use contraceptives?</li> <li>• Do you think your daughter-in-law should use contraceptives?</li> <li>• Are you influential in decision making about contraceptive use of your daughter-in-law?</li> <li>• Have you ever shared with your daughter-in-law your experience of using family planning services?</li> </ul>
<b>Community factors</b>	<ul style="list-style-type: none"> <li>• Is there social consensus in your community that women should become pregnant soon after marriage?</li> <li>• When you were young, did you feel pressure to become pregnant soon after marriage? If so, who did you feel pressure from?</li> <li>• Do FCHVs in this municipality discuss family planning services with young couples?</li> </ul>

## Topic Guide for Health Care Providers, Health Coordinators and FCHVs

<b>Community factors</b>	<ul style="list-style-type: none"> <li>• Is there social consensus in this community that women should become pregnant soon after marriage?</li> <li>• Has your religion something to do with non-use of contraceptives after marriage?</li> <li>• Do FCHVs in this municipality discuss family planning services with young couples?</li> </ul>
<b>Organizational factors</b>	<ul style="list-style-type: none"> <li>• What is a major challenge for local women especially when seeking family planning services in this municipality?</li> <li>• Do women in this municipality have to seek permission from their husband if they go out to a health facility?</li> <li>• What is a major challenge in providing family planning services in your municipality or health facility? (Availability of commodities and equipment, training for nurses/ANM)</li> <li>• What is your concern in family planning programme in this municipality? (budget, planning, leadership/governance, health information, supplies, availability and capacity of health workers)</li> <li>• Are there any other issues that one should be aware of when understanding access to family planning services in this municipality?</li> </ul>
<b>Policy factors</b>	<ul style="list-style-type: none"> <li>• Is there any restriction of family planning services on age?</li> <li>• Can young people below the age of 18 receive family planning services in this municipality or facility as they wish?</li> <li>• Is there any restriction of family planning services on marital status?</li> <li>• Can unmarried couples receive family planning services in this municipality or facility as they wish?</li> </ul>

**Supplementary 2:** Consolidated criteria for reporting qualitative studies (COREQ): a 32-item checklist

**Title:** Multilevel factors influencing contraceptive use and childbearing among adolescent girls in Bara district of Nepal: A qualitative study using the social-ecological model

**Authors:** Kazutaka Sekine, Nirajan Khadka, Rogie Royce Carandang, Ken Ing Cherng Ong, Anand Tamang, and Masamine Jimba

Topic	Guide questions/description	Response
<b>Domain 1: Research team and reflexivity</b>		
<i>Personal Characteristics</i>		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Five research assistants (four women and one man) hired for this research conducted the interviews. KS and NK supervised the data collection process.
2. Credentials	What were the researcher's credentials? E.g., Ph.D., MD	Ph.D., MSc, MA, MD
3. Occupation	What was their occupation at the time of the study?	PhD student, Professor, Assistant Professor, and Director of an NGO
4. Gender	Was the researcher male or female?	All the concerned researchers are male. Four of the local research assistants involved in data collection are female and one male.
5. Experience and training	What experience or training did the researcher have?	KS, RRC, AT, and MJ have experiences in qualitative research.
<i>Relationship with participants</i>		
6. Relationship established	Was a relationship established before study commencement?	None of the concerned researchers had relationships with the participants until study commencement.
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g., personal goals, reasons for doing the research	None of the participants had contact with the concerned researchers before this study. The aim, objectives, and procedures of the study was explained to the participants before participation.
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g., bias, assumptions, reasons, and interests in the research topic	All of the assistants have a bachelor's degree in public health or sociology. They speak the local language (i.e., Bhojpuri) and are experienced in qualitative research. Before data collection, they were trained to avoid the biases that typically interfere with the collection of qualitative data and to address ethical considerations.

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**Domain 2: Study design**


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*Theoretical framework*

9. Methodological orientation and Theory      What methodological orientation was stated to underpin the study? e.g., grounded theory, discourse analysis, ethnography, phenomenology, content analysis

The socio-ecological model was adopted as the theoretical framework that guided the development of research tools. Also, a directed approach to content analysis was employed for data analysis in this study.

*Participant selection*

10. Sampling      How were participants selected? e.g., purposive, convenience, consecutive, snowball

Convenience sampling

11. Method of approach      How were participants approached? e.g., face-to-face, telephone, mail, email

Door-to-door visits.

12. Sample size      How many participants were in the study?

70 participants (60 for IDIs and 10 for KIIs)

13. Non-participation      How many people refused to participate or dropped out? Reasons?

None of the participants refused to participate or dropped out in the study.

*Setting*

14. The setting of data collection      Where was the data collected? e.g., home, clinic, workplace

IDIs and KIIs were conducted in a private space that was chosen by the participants and at a time that was convenient to them.

15. Presence of nonparticipants      Was anyone else present besides the participants and researchers?

Nobody

16. Description of sample      What are the important characteristics of the sample? e.g., demographic data, date

Characteristics of the IDI participants are provided in Table 2.

*Data collection*

17. Interview guide      Were questions, prompts, guides provided by the authors? Was it pilot tested?

Based on literature reviews, the authors developed the conceptual framework (Figure 1) that guided the development of research tools. For each group of the participants, a separate topic guide was developed and used. Prior to data collection, a topic guide was pretested on two married adolescent girls to determine the feasibility of the tool and refine the questions.

18. Repeat interviews      Were repeat interviews carried out? If yes, how many?

No.



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19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	All the IDIs and KIIs were audio-recorded and transcribed verbatim.
20. Fieldnotes	Were field notes made during and/or after the interview or focus group?	Field notes were made during the interviews.
21. Duration	What was the duration of the interviews or focus group?	The interviews lasted for about one hour.
22. Data saturation	Was data saturation discussed?	Yes. The sample size allowed the researchers to reach thematic saturation that is when no new information emerges.
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No.

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### Domain 3: Analysis and findings

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#### *Data analysis*

24. Number of data coders	How many data coders coded the data?	Two researchers (KS and NK) was responsible for coding.
25. Description of the coding tree	Did authors provide a description of the coding tree?	No.
26. Derivation of themes	Were themes identified in advance or derived from the data?	Themes were identified in advance based on the social-ecological model and literature reviews. However, new codes were given to any texts that could not be categorized with the initial coding scheme.
27. Software	What software, if applicable, was used to manage the data?	We used NVivo 9 (QSR International, Cambridge, MA) to facilitate coding, organization, searching for meaning units embedded within the English transcripts, and systematically compare the emergent categories and themes both within and across the cases.
28. Participant checking	Did participants provide feedback on the findings?	Respondent validation could not be conducted due to logistical constraints, and lack of personal information of the respondents.
<i>Reporting</i>		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g., participant number	Participant quotations are presented to illustrate themes.
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Consistency between the data presented and the findings is ensured in the article.

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4	31. Clarity of major themes	Were major themes clearly presented in the findings?	Yes, in the results section.
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7	32. Clarity of minor themes	Is there a description of diverse cases or a discussion on minor themes?	Relatively minor themes that are supported by a few participant quotations are included in the result section.
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12 Reference: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a  
13 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007;19(6):349-57.  
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# BMJ Open

## Multilevel factors influencing contraceptive use and childbearing among adolescent girls in Bara district of Nepal: a qualitative study using the socio-ecological model

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Manuscript ID	bmjopen-2020-046156.R1
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Date Submitted by the Author:	11-Sep-2021
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<b>Primary Subject Heading</b>:	Reproductive medicine
Secondary Subject Heading:	Qualitative research
Keywords:	SEXUAL MEDICINE, REPRODUCTIVE MEDICINE, QUALITATIVE RESEARCH, PRIMARY CARE

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## 1      **Multilevel factors influencing contraceptive use and childbearing among** 2      **adolescent girls in Bara district of Nepal: a qualitative study using the socio-** 3      **ecological model**

5      Kazutaka Sekine<sup>a\*</sup>, Nirajan Khadka<sup>b</sup>, Rogie Royce Carandang<sup>a</sup>, Ken Ing Cherng Ong<sup>a</sup>,  
6      Anand Tamang<sup>c</sup>, and Masamine Jimba<sup>a</sup>

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### 17      **ABSTRACT:**

18      **Objectives:** This study aimed to identify the multilevel factors that influence  
19      contraceptive use and childbearing decisions in Nepal and examine relationships among  
20      these factors.

21      **Design:** The study drew on qualitative data collected through in-depth interviews (IDIs)  
22      and key informant interviews (KIIs) and triangulated results.

23      **Setting:** An urban municipality and a rural municipality in Bara district, Nepal.

24      **Participants:** We recruited a total of 60 participants (e.g., 20 married adolescent girls  
25      aged 15 to 19, 20 husbands, 20 mothers-in-law) for IDIs and 10 (e.g., four health care  
26      providers, three health coordinators, three female community health volunteers) for KIIs.

27      **Results:** Married adolescent girls faced a range of barriers that are interrelated across  
28      different levels. Patriarchal norms and power imbalances between spouses limited their  
29      decision-making power regarding contraception. Social pressures to give birth soon after  
30      marriage drove the fear of infertility, abandonment, and the stigmatization of childless  
31      married couples, which leads to lack of women's autonomy in making decisions about  
32      family planning. Mothers-in-law and religion exerted considerable influence over couples'  
33      decisions regarding contraception. Limited access to information about the benefits and  
34      methods of family planning contributed to fear of the side effects of contraceptives and  
35      low awareness about the risks involved in adolescent pregnancy.

36      **Conclusions:** The convergent results from triangulation confirm that the decision to  
37      postpone childbearing is not merely the personal choice of an individual or a couple,  
38      highlighting the importance of targeting families and communities. The study  
39      underscores the need to challenge restrictive socio-cultural norms so that adolescent girls  
40      become empowered to exercise greater control over contraceptive use.

### 43      **STRENGTHS AND LIMITATIONS OF THIS STUDY**

- 44      • The present study is one of the first qualitative studies to identify the multilevel,  
45      interrelated factors that influence contraceptive use and childbearing among  
46      married adolescent girls.
- 47      • The study drew on multiple sources to collect rich and diverse data using a

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6 48 convenience sample from a single district and triangulated results.  
7 49 • The comprehensive approach guided by the socio-ecological model allowed us to  
8 50 analyze a complex interplay of multilayered factors that hinder contraceptive use.  
9 51 • The study is limited in the possibility of respondents having felt inhibited to share  
10 52 their personal experiences candidly in the presence of an interviewer.  
11 53 • It was not possible to conduct respondent validation due to logistical constraints  
12 54 and lack of personal information of the respondents.  
13 55

14 56 **Keywords:** Adolescents; contraceptive use; childbearing; qualitative study; socio-  
15 57 ecological model; Nepal  
16 58

## 17 59 **WORD COUNT**

18 60 5,172  
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## 21 63 **INTRODUCTION**

22 64  
23 65 Adolescent pregnancies and childbirths are a global concern. Each year, 21 million 15 to  
24 66 19-year-old girls in low- and middle-income countries (LMIC) become pregnant, of  
25 67 which 12 million girls give birth [1]. Births to adolescents of this age group account for  
26 68 11 % of all childbirths worldwide [2]. Approximately 5.7 million pregnancies in the same  
27 69 population segment result in abortion [1]. In LMIC, 50 % of all pregnancies among 15 to  
28 70 19-year-old girls are unintended [3]. Among adolescent girls who want to avoid  
29 71 pregnancy, 14 million have an unmet need for modern contraception [1]. Addressing this  
30 72 need might reduce unintended pregnancy and unplanned births by 6.2 million and 2.1  
31 73 million annually, respectively [1].  
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33 75 Global and national policies often assume that the primary reason for contraceptive  
34 76 nonuse among adolescent girls is their personal choice (or the choice of couples).  
35 77 However, several other factors also prevent them from seeking family planning services  
36 78 and delaying childbearing in LMIC. Researchers have noted a number of factors that  
37 79 hinder married adolescent girls from using contraceptive methods and postponing  
38 80 childbearing. These factors can be classified into five categories: individuals (e.g., limited  
39 81 knowledge, the fear of adverse side effects) [4–8], interpersonal (e.g., partner's refusal to  
40 82 use contraceptives) [4,5,7], family-related (e.g., influence of mothers-in-law and sisters-  
41 83 in-law) [4,7], social acceptability (e.g., community expectations to prove one's fertility)  
42 84 [7,8], and service delivery-related (e.g., confidentiality and privacy issues) [9]. However,  
43 85 a shortcoming of the previous qualitative research is narrow focuses on each level without  
44 86 examining interactions or interrelations across different levels. Few in-depth  
45 87 investigations have been conducted to promote the nuanced understanding of a complex  
46 88 interplay of multilayered factors that hinder contraceptive use [10]. Therefore, it is  
47 89 necessary to identify a host of the factors that impede contraceptive use and promote early  
48 90 childbearing.  
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50 92 In Nepal, the adolescent birth rate remains high at 88 births per 1000 adolescent girls aged  
51 93 15 to 19 in 2016 [11], and this figure is the second-highest in South Asia after Bangladesh  
52 94 [12]. A national survey showed that 17 % of 15 to 19-year-old adolescent girls were  
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5 95 pregnant in the same year [11]. Among Nepali adolescents, pregnancy is related to a lower  
6 96 economic status, membership to a disadvantaged ethnic group, and unemployment [13].  
7 97 The prevalent practice of child marriage also contributes to the high rate of adolescent  
8 98 pregnancy and is associated with contraceptive nonuse before the first childbirth in Nepal  
9 99 [14], India [14,15], and Bangladesh [16]. In a nationally representative survey, 40 % of  
10 100 20 to 24-year-old Nepali women were married before the age of 18 [11]. About one in  
11 101 two married adolescent girls aged 15 to 19 years give birth to her first child before turning  
12 102 20, typically soon after marriage [11]. Although the Nepali government and its  
13 103 development partners have taken efforts to improve access to family planning services  
14 104 and information, contraceptive use remains disproportionately low among adolescent  
15 105 girls. Only 15 % of married adolescent girls aged 15 to 19 use any modern contraception;  
16 106 in contrast, the corresponding figure is 41 % among adult women aged 20 or above [11].  
17 107 Therefore, this study aimed to identify the multilevel factors that influence contraceptive  
18 108 use and childbearing decisions in Nepal and to examine relationships among these factors.  
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## 23 110 **METHODS**

### 24 111 25 112 **Study setting**

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28 114 We conducted this study in an urban municipality (Mahagadimai Nagarpalika composed  
29 115 of 12 wards) and a rural municipality (Prasauni Gaunpalika composed of six wards) in  
30 116 Bara district in Province 2 of Southern Nepal. The province has the highest child marriage  
31 117 prevalence rate (65 %) among women aged 20 to 24 years in 2016 [11]. We purposively  
32 118 selected these two municipalities from five urban municipalities and nine rural  
33 119 municipalities based on consultation with respective municipality officials. Then, we  
34 120 randomly selected one ward in each selected municipality.  
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37 122 Province 2 where Bara district is considered as least developed region in Nepal, with the  
38 123 lowest human development index value [17]. Gender disparity of the region in terms of  
39 124 education and income is the most pronounced, with the lowest gender development index  
40 125 value [17]. The district is home to 108,655 households (i.e., an average of 6.3 members  
41 126 per household) [18]. The most dominant religion is Hinduism, followed by Islam and  
42 127 Buddhism. The men who live in these areas were primarily farmers, laborers, and small-  
43 128 scale business owners or employees. Married women were mostly involved in household  
44 129 work and farming. Most households have electricity, but power outages are frequent. Few  
45 130 houses have a latrine [18]. Using solid fuel such as firewood and charcoal is common.  
46 131 Each municipality has at least one health post where only primary health care services are  
47 132 provided.  
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### 50 133 51 134 **Study participants**

52 135  
53 136 This study relied on multiple sources to collect rich and diverse data and triangulated  
54 137 results. We recruited three different groups for in-depth interviews (IDIs) to cover a wide  
55 138 range of perspectives of household members. The first group was 15 to 19-year-old  
56 139 adolescent girls who had been married for at least six months and were living with their  
57 140 husbands (n=20) at the time of data collection. The second group was husbands of married  
58 141 adolescent girls (n=20). The last group was mothers-in-law of married adolescent girls  
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(n=20). We did not match IDIs participants by family for recruitment or analysis. As a complementary method, we also conducted key informant interviews (KIIs) with those who possessed first-hand knowledge about community perceptions of and barriers to adolescent pregnancy. Participants for KIIs were healthcare providers working in a government healthcare facility (n=4), health coordinators working in the district health office or municipality office (n=3), and female community health volunteers (FCHVs) working in the study areas (n=3). Table 1 shows the focuses of IDIs and KIIs.

**Table 1.** Focuses of IDIs and KIIs

Type of participants	Focuses of IDIs and KIIs
Married adolescent girls	Knowledge about and access to FP information and services, perceived needs, decision-making power, influences of in-laws, social and gender norms, religious beliefs, privacy and confidentiality, attitude of healthcare providers, policy restrictions, and political priorities
Husbands	Knowledge about and access to FP information and services, perceived needs, decision-making power, influences of in-laws, social and gender norms, religious beliefs, privacy and confidentiality, attitude of healthcare providers, policy restrictions, and political priorities
Mothers-in-law	Knowledge about and access to FP information and services, perceived needs, decision-making power, influences of in-laws, social and gender norms, and religious beliefs
Healthcare providers/health coordinators/FCHVs	Access to FP information and services, social and gender norms, religious beliefs, challenges in providing FP services, policy restrictions, and political priorities

IDIs: in-depth interviews; KII: key informant interviews; FP: family planning; FCHVs: female community health volunteers

In the selected two wards, we purposively recruited those who met the aforementioned inclusion criteria with the help of local research assistants (the details regarding the assistants are provided below). As sampling frames were not available in the study areas, we used convenience sampling (i.e., door-to-door visits) to recruit participants of the study. We included minors aged 15 to 17 years for the study as they were disproportionately underserved by family planning programs in Nepal. Vulnerabilities that are specific to this age group may account for the lower uptake of family planning services. We did not consider birth history or contraceptive use history for recruitment.

### Data collection

From July 5-15, 2019, we conducted semi-structured IDIs and KIIs, using topic guides. These interviews focused on the knowledge, attitudes, beliefs, perceptions, and



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6 166 experiences that pertain to contraceptive use and childbearing (Table 1). We adopted  
7 167 these data collection methods as they afford great flexibility in navigating the interview  
8 168 and depth of exploration in qualitative research [19]. We developed the topic guides based  
9 169 on the socio-ecological model (SEM) [20], literature reviews, and the research team's  
10 170 field observations to include previously identified key issues. The SEM is a theoretical  
11 171 framework to understand the dynamic interactions and interrelations of multilevel factors  
12 172 that determine health behaviors [21]. McLeroy et al. [20] identified five levels of  
13 173 influence that are specific to health behaviors: intrapersonal factors, interpersonal factors,  
14 174 community factors, institutional factors, and policy factors. Based on literature reviews,  
15 175 we developed a conceptual framework (Figure 1), which was adapted from the SEM. We  
16 176 developed and used a separate topic guide for each group. Prior to data collection, we  
17 177 pretested one of the topic guides on two married adolescent girls to determine the  
18 178 feasibility of this strategy and refine the questions. The topic guides in English are  
19 179 available as a supplementary (S1).  
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23 181 Five Nepali research assistants (four women and one man) collected data. They speak the  
24 182 local language (i.e., Bhojपुरी) and are experienced in qualitative research. We trained  
25 183 them for three days to avoid the biases that typically interfere with the collection of  
26 184 qualitative data (e.g., friendliness bias, social desirability, confirmation bias, question-  
27 185 order bias) and to address ethical considerations. All of the assistants have a bachelor's  
28 186 degree in public health or sociology. They conducted individual face-to-face IDIs and  
29 187 KIIs in a private space chosen by the participants and at a time convenient to them. The  
30 188 sex of the interviewer matched the sex of the participant. The interviewers established  
31 189 rapport with the participants before commencing the interviews. They began the interview  
32 190 with general questions and moved onto more specific questions, including open-ended  
33 191 questions about their experiences of and perceptions about contraception. The interviews  
34 192 lasted for approximately one hour and were audio-recorded to help verify descriptive data.  
35 193 The interviewers transcribed verbatim both the IDIs and KIIs within 24 hours of each  
36 194 interview. Subsequently, the second author (NK) translated the transcribed interviews  
37 195 into English. The interviewers checked the translated text for errors and omissions  
38 196 (including context and content accuracy).  
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## 42 198 **Data analysis**

43 199

44 200 We analyzed the data using a directed approach to content analysis, which is described  
45 201 by Graneheim and Lundman [22] and Hsieh and Shannon [23], and in accordance with  
46 202 the conceptual framework. Two authors (KS and NK) read English transcripts several  
47 203 times to immerse into the data and gained a sense of the whole. We coded and analyzed  
48 204 the meaning units, which were embedded within the transcripts. We also highlighted all  
49 205 texts, which, on the first impression, appear to represent factors influencing contraceptive  
50 206 use and adolescent childbearing. The next step in the analysis was to code all highlighted  
51 207 passages using predetermined codes based on the conceptual framework (Figure 1). We  
52 208 gave new codes to any texts that could not be categorized with the initial coding scheme,  
53 209 and then reviewed and revised these codes during the entire coding process. When  
54 210 inconsistencies emerged, we further refined the codes through discussion until we reached  
55 211 consensus. We grouped emergent codes into categories, and further classified into themes  
56 212 in accordance with the conceptual framework: intrapersonal, interpersonal, community,  
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organizational, and policy-level factors. We translated relevant participant quotations and used them to illustrate themes. We adopted various measures to ensure that the publication of these responses does not violate the code of confidentiality. For instance, we used unique reference numbers to protect the identity of the participants. Finally, we constructed linkages among emergent categories and themes through axial coding. Respondent validation could not be conducted due to logistical constraints, and lack of personal information of the respondents. We used NVivo 9 (QSR International, Cambridge, MA) to facilitate coding, organization, searching for meaning units embedded within the English transcripts, and systematically compare the emergent categories and themes both within and across the cases. The qualitative methods and reporting of results in the present study adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) [24] and Standards for Reporting Qualitative Research [25]. We filled and provided the COREQ as a supplementary file (S2).

### **Strategies to deal with validity threats**

We employed various strategies for establishing three types of threats to validity that are pertinent to qualitative research [26]. The measures taken to reduce threats to descriptive and interpretative validity included using verbatim transcripts of the interviews, presenting participant quotations without shortening, asking open-ended questions, peer debriefing, collecting and analyzing rich data, and providing the thick description of the setting, participants, and themes. The research design of triangulation from a range of individuals and two data collection approaches helped handle threats to both interpretative and theoretical validity.

### **Ethical considerations**

The present study was approved by the Research Ethics Committee of the Graduate School of Medicine, the University of Tokyo (2019030NI), and the Nepal Health Research Council (3001) in Kathmandu. We secured written informed consent from the participants after they were informed about the aim, objectives, and procedures of the study. For those who were younger than 18 years, we obtained written informed consent from their parents. If the parent or carer was inaccessible in the neighborhood, we obtained it from minor participants. Participation in the present study was voluntary, and the participants were free to skip interview questions or withdraw their participation at any time without penalty. They were not required to provide any personal information (e.g., name, address, phone number) during the interviews. We used unique reference numbers to protect the identity of the participants.

### **Patient and public involvement**

Participants and the public were not involved in the study design or planning of the data analysis.

## **RESULTS**

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6 259 **Participant characteristics**  
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8 261 Table 2 summarizes participants' characteristics. The mean age of the participating  
9 262 adolescent girls was 17.8 years (interquartile range (IQR) 17.0 to 18.3). A majority of  
10 263 them were married before the age of 18. Approximately half of them had at least one  
11 264 child, and several others were pregnant. Almost all of them had become full-time  
12 265 housewives living with their in-laws after marriage. All the adolescent girls had  
13 266 discontinued their education. The mean age of the husbands and mothers-in-law was 23.5  
14 267 (IQR 21.0 to 25.3) and 48.4 (IQR 41.5 to 52.3), respectively. More than a half of the  
15 268 participants for IDIs were Hindu. Most of the husbands were farmers or casual laborers.  
16 269 The mothers-in-law had limited educational attainment. As providing the demographic  
17 270 characteristics of the KII participants might allow for their identification, we did not  
18 271 include such information in this article.  
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**Table 2.** Demographic characteristics of the participants for in-depth interviews

	<b>Married adolescent girls (n=20)</b>		<b>Husbands (n=20)</b>		<b>Mothers-in-law (n=20)</b>			
	M	P	M	P	M	P		
<b>Age (years)</b>			<b>Age (years)</b>		<b>Age (years)</b>			
15–17	1	5	15–19	3	0	30–39	2	0
18–19	9	5	20–24	3	8	40–49	4	5
<b>Age at marriage (years)</b>			25–29	2	3	50–59	3	3
12–14	3	3	30–34	1	0	60–69	1	2
15–17	5	7						
18–19	2	0						
<b>Religion</b>			<b>Religion</b>			<b>Religion</b>		
Hinduism	6	7	Hinduism	6	6	Hinduism	6	7
Islam	4	3	Islam	3	5	Islam	4	3
<b>Ethnicity</b>			<b>Ethnicity</b>			<b>Ethnicity</b>		
Madhesi	4	0	Madhesi	1	2	Madhesi	4	4
Muslim	4	4	Muslim	3	5	Muslim	4	3
Terai Dalit	1	5	Terai Dalit	5	4	Terai Dalit	2	3
Others (Teli or unknown)	1	1						
<b>Educational attainment</b>			<b>Educational level</b>			<b>Educational level</b>		
No education or some level of primary education	4	4	No education or some level of primary education	1	0	No education or some level of primary education	9	10
Completed primary school	1	3	Completed primary school	1	2	Completed primary school	1	0
Some level of secondary education	2	3	Some level of secondary education	3	6			
Completed secondary school	1	0	Completed secondary school	0	0			
Higher education	2	0	Higher education	4	3			
<b>Occupation</b>			<b>Occupation</b>			<b>Occupation</b>		
Unemployed	10	9	Farmer	4	0	Unemployed	2	4
Tailor	0	1	Laborer	3	4	Farmer	3	6
<b>Number of children</b>			Businessperson	2	4	Laborer	3	0

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0	3	8	Teacher	0	1	CHV	1	0
1	4	2	Helper	0	1	Businessperson	1	0
2	3	0	Tailor	0	1			

272 M: Mahagadimai Nagarpalika; P: Prasauni Gaunpalika; CHV: Community health volunteer

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For peer review only

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6 274 **Intrapersonal factors**

7 275

8 276 ***Fear of and misconceptions about side effects on health***

9 277 Both the married adolescent girls and husbands considered their fear of the side effects  
10 278 of contraceptive methods to be a factor that influences their decisions about family  
11 279 planning. They were concerned that the use of such tools would adversely affect their  
12 280 physical health. They also held misconceptions about the side effects of contraceptives.  
13 281 The following characteristic responses illustrate this observation:  
14 282

15 283

16 283 *I have heard that if we use an implant, there will be a lot of bleeding. Pills will harm*  
17 284 *the body, and it will feel hot if you use them.* (Ref. #122, married adolescent girl, 18  
18 285 years)  
19 286

20 287

21 287 *There is a chance of becoming infertile if contraceptives are used for a long time.*  
22 288 (Ref. #992, husband, 21 years)  
23 289

24 290

25 291 ***Lack of access to information***

26 292 Several married adolescent girls were unaware that they could avail of family planning  
27 293 services free of charge at public healthcare facilities. All the three groups demonstrated  
28 294 poor knowledge about family planning services.

29 295

30 295 *I think there is a need for family planning services and information. However, no*  
31 296 *one provided us with such information about free family planning services.* (Ref.  
32 297 #630, married adolescent girl, 17 years)  
33 298

34 299

35 300 ***Shyness and embarrassment***

36 301 Most of the married adolescent girls cited shyness and embarrassment as barriers that  
37 302 prevented them from discussing the timing of childbearing and contraceptive use with  
38 303 their husbands. Both the married adolescent girls and husbands were not inclined to seek  
39 304 family planning information and services, especially from healthcare providers of the  
40 305 opposite sex.

41 306

42 306 *I will feel very shy to ask about family planning methods. It was only a year of my*  
43 307 *marriage, and they [healthcare providers] told me not to use contraceptives. If I*  
44 308 *must ask anybody about it, I will feel very shy.* (Ref. #460, married adolescent girl,  
45 309 17 years)  
46 310

47 311

48 312 ***Low awareness about the risks involved in adolescent or multiple pregnancies***

49 313 Low awareness and misinformation about the risks involved in adolescent childbearing  
50 314 emerged as a contributor to contraceptive nonuse. While only a few married adolescent  
51 315 girls were aware that adolescent pregnancy was associated with an increased risk of  
52 316 obstetric complications, several respondents had low levels of knowledge about the risk.

53 317

54 317 *If a woman gives birth before 18 years of age, she will suffer from weakness,*  
55 318 *stomachache, and vomiting and will not be able to work much and always feel*  
56 319 *sleepy.* (Ref. #122, married adolescent girl, 18 years)  
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### 321 **Limited autonomy in making decisions about family planning**

322 The respondents were governed by strong cultural norms, which empower husbands to  
 323 make all household decisions and disallow wives from making independent decisions.  
 324 Such patriarchal values, wives' financial dependence, and power imbalances between  
 325 spouses had restricted women's decisions about contraceptive use. A few married  
 326 adolescent girls reported that their husbands had refused to use contraceptives. They also  
 327 noted that defying their husband's decisions would lead to family feuds.

328  
 329 *If I use it [contraceptives] and if I start having its side effects, then my husband will*  
 330 *scold me. That is why he takes all the decisions. He makes major decisions because*  
 331 *he earns and governs the family. (Ref. #122, married adolescent girl, 18 years)*

332  
 333 *In our community, men make all decisions. I want to use contraceptives, but he does*  
 334 *not want me to. He does not agree on the use of contraceptives. According to him,*  
 335 *it will harm my body. (Ref. #335, married adolescent girl, 17 years)*

336  
 337 *We [young wives] must live on another person's income to live and have to do*  
 338 *whatever the other person says. That is why we do not have the right to make*  
 339 *decisions. (Ref. #460, married adolescent girl, 17 years)*

### 340 **Interpersonal factors**

#### 341 **Influence of mothers-in-law**

342  
 343 The mothers-in-law undermined their daughter-in-law's autonomy in making decisions  
 344 about contraception. Most of the married adolescent girls reported that their mothers-in-  
 345 law had pressurized them into not using contraceptives until they had an ideal number of  
 346 children.  
 347

348  
 349 *My mother-in-law influenced my decision. She has the right to make decisions*  
 350 *regarding my contraception and childbearing. (Ref. #241, married adolescent girl,*  
 351 *16 years)*

#### 352 **Limited mobility**

353  
 354 Most of the Hindu and Muslim wives considered limited mobility to be a barrier that  
 355 hindered them from accessing family planning information and services as their husbands  
 356 and mothers-in-law restricted their rights to travel.  
 357

358  
 359 *If I do not take permission to go out, there is a chance of fighting with my husband.*  
 360 *(Ref. #241, married adolescent girl, 16 years)*

361  
 362 *Women must seek permission to go out not only from their husbands but also from*  
 363 *their parents-in-law and other elders in the family. Only a few disobey such norms*  
 364 *and go to a health facility for service. Exclusion and violence against women are a*  
 365 *common consequence if they disobey family norms. (Ref. #587, FCHV, 35 years)*

### 366 **Community factors**

### ***Social pressure to give birth soon after marriage and fear of infertility***

Most of the married adolescent girls, husbands, and mothers-in-law cited the extreme pressures to give birth soon after marriage as a reason for contraceptive nonuse and early childbearing. The married adolescent girls noted that, if a woman does not give birth within the first three years of her marriage, others will make fun of the woman and gossip about her infertility. They were afraid of abandonment and the stigmatization of childless married couples. Their family and community members had intimidated them into becoming pregnant. The married adolescent girls believed that their communities expected them to deliver their first child within the first year of marriage. In contrast, most of the husbands thought their community members expected couples to have their first child between the second and fifth year of marriage.

*My community believes that women should give birth in the first year of their marriage. If they do not, people will start suspecting and gossiping about their infertility. (Ref. #29, married adolescent girl, 19 years)*

*If a couple does not have a child after 4-5 years of marriage, people have negative thoughts about it. They would ask, "Why doesn't she have a child?" [and] "Is she having a problem with her reproductive capacity?" If she does not have a child after 3 to 4 years, parents may decide to arrange another marriage for the son. (Ref. #230, husband, 22 years)*

As illustrated by the following response provided by a mother-in-law, the fear of elopement can exacerbate such social pressures.

*Community members think that getting pregnant soon after marriage is good as women cannot elope with another guy if they have a child. They can better take care of their child and give birth to a healthy baby. (Ref. #756, mother-in-law, 55 years)*

Concerns about child health and development also contribute to the pressures to which women are subjected.

*They [my family] also think that giving birth soon after marriage will contribute to the early development of the baby. (Ref. #630, married adolescent girl, 17 years)*

### ***Role of religious beliefs in contraceptive use***

Religious beliefs were a major barrier that prevented Muslim women from seeking contraceptives. However, Hindu women did not share the same perspective.

*Our religion [Islam] teaches that the use of contraceptives is a sinful act. (Ref. #930, married adolescent girl, 19 years)*

*In Islam, we believe that if we use contraceptives, God becomes unhappy and punishes us. (Ref. #241, married adolescent girl, 16 years)*

### ***Lack of engagement with FCHVs***

FCHVs, who are responsible for disseminating reproductive health information,



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6 415 conducting family planning counseling and distributing condoms and oral pills in their  
7 416 communities, did not actively engage with married adolescent girls and involve them in  
8 417 family planning activities. Women's restricted mobility impeded their access to FCHVs  
9 418 and opportunities to learn about contraceptive methods.  
10 419

11 420 *I have never met a female health volunteer since I never go out of my home. I do*  
12 421 *not think there is a discussion about this [family planning issues] in our community.*  
13 422 (Ref. #892, married adolescent girl, 18 years)  
14 423

15 424 *I know that there are mothers' group meetings regularly in this municipality, but I*  
16 425 *haven't noticed or heard that FCHVs discuss with young couples about family*  
17 426 *planning issues.* (Ref. #352, mother-in-law, 48 years)  
18 427

## 20 428 **Organizational factors**

### 21 429 ***Lack of privacy and confidentiality***

22 430  
23 431 A few of the husbands and healthcare providers reported that concerns about  
24 432 confidentiality deterred married couples from visiting healthcare facilities to obtain  
25 433 contraceptives.  
26 434

27 435 *Confidentiality is not maintained in some private clinics because my single friend*  
28 436 *went to a private clinic to buy condoms, and, later, this information was spread*  
29 437 *among their professional network.* (Ref. #992, husband, 21 years)  
30 438

31 439 *Couples themselves do not feel comfortable with going to government health*  
32 440 *facilities owing to a lack of privacy and confidentiality. There is no separate space*  
33 441 *for family planning counseling and services in health facilities.* (Ref. #729, health  
34 442 care provider, 31 years)  
35 443

### 36 444 ***Attitudes of healthcare providers***

37 445 A few of the married adolescent girls complained about the attitudes of healthcare  
38 446 providers.  
39 447

40 448 *When seeking antenatal check-up during my pregnancy at a private clinic, the staff*  
41 449 *members were not friendly to me. They spoke only to my husband and asked him*  
42 450 *about my problem.* (Ref. #335, married adolescent girl, 17 years)  
43 451

44 452 Healthcare providers reported other health systems-related barriers that prevented them  
45 453 from accessing family planning services, including (i) stockouts of contraceptives at  
46 454 healthcare facilities, (ii) the unavailability of female health workers who could provide  
47 455 family planning counseling and services to female clients, and (iii) overlap between the  
48 456 working hours (10 am to 3 pm) of healthcare facilities and the time at which the  
49 457 housewives tended to be busy with their household duties.  
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### 51 459 **Policy-level factors**

52 460  
53 461 None of the participants reported policy-level factors.  
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## DISCUSSION

This study is one of the first qualitative studies to identify the multilevel, interrelated factors that influence contraceptive use and childbearing among married adolescent girls. It extends the evidence base by illustrating the multidimensionality and interaction of the factors that limit young married women's family planning knowledge, undermine their autonomy in decision making, reduce contraceptive use, and increase the risk of adolescent pregnancy. The barriers were intertwined and influenced each other across different levels of the SEM (Figure 2). The barriers were identified across the intrapersonal, interpersonal, community, and organizational levels. Barriers at the intrapersonal level were reluctance to seek family planning information and services, the fear of and misconceptions about side effects of contraceptives, low awareness about the risks involved in adolescent pregnancy, a lack of access to information, and limited autonomy in making decisions about family planning. Barriers at the interpersonal level were restricted mobility, power imbalances between spouses, and mothers-in-law's influence. Barriers at the community level were the fear of infertility and abandonment, the stigmatization of childless married couples, normative gender roles, and social pressures to give birth soon after marriage, which emerged as root causes of contraceptive nonuse. Barriers at the organizational level were a lack of privacy and confidentiality, and the unfriendliness of healthcare providers. The hypothetical relationships in Figure 2 are depicted based on the findings from the present study.

The women who participated in this study were not empowered to make independent decisions about contraception. Their husbands and mothers-in-law were deeply involved in this decision-making process. Adolescent married girls, their husbands, and mothers-in-law keenly felt the pressure to bear a child within the first few years of marriage. None of the participating husbands and in-laws supported the idea of delaying the first pregnancy. Disapproval of contraceptive use before having an ideal number of children in the family was prevalent among them. Newly married adolescent girls had often become pregnant before they were ready to fulfill familial expectations to bear a child and prove their fertility. Patriarchal norms and power imbalances between spouses made married adolescent girls hesitate or refrain from talking to their husbands about family planning and limited their decision-making power regarding contraception. The present findings corroborate with previous studies that have found social pressures to give birth soon after marriage in India [4,6], Bangladesh [7,8], and Iran [27] and limited autonomy in making decisions about family planning in Nepal [10], Bangladesh [7], and Iran [27] and among Syrian refugees in Lebanon [5].

The married adolescent girls felt insecure, presumably because newly married women are not considered to be a valuable member of their in-law's family until they prove their fertility. Similar to the findings of previous studies in Iran [27] and Bangladesh [8], delivering a healthy child soon after marriage was perceived as a means to establishing her identity and consolidating her position within her husband's family. Additionally, labor migration to India, Malaysia, and the Middle East was common in the study areas.

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6 508 As such, having a child may be perceived as a way to cement the bond between a  
7 509 husband and his wife before his departure [8].

8 510  
9 511 Married adolescent girls' views on family planning were shaped by their mothers-in-  
10 512 law. They exerted considerable influence over couples' decisions regarding  
11 513 contraception as they were perceived as the most experienced household member in  
12 514 relation to family planning. Their pressure on daughters-in-law to prove fertility within  
13 515 the first few years of marriage was identified as a strong driver of contraceptive nonuse.  
14 516 Given the restricted mobility of married adolescent girls, mothers-in-law and sisters-in-  
15 517 law were their primary sources of information about contraception. Similar results  
16 518 regarding the influence of mothers-in-law have been reported in Nepal [10], Bangladesh  
17 519 [7], and Lao People's Democratic Republic [9].

18 520  
19 521 Social pressures to give birth soon after marriage, normative gender roles, and religious  
20 522 beliefs emerged as the root causes of contraceptive nonuse. Social pressures to have a  
21 523 child soon after marriage drove the fear of infertility, abandonment, and the  
22 524 stigmatization of childless married couples, which impeded the married adolescent  
23 525 girls' access to family planning services. Mothers-in-law may amplify the social  
24 526 pressure to have a child soon after marriage. Normative gender roles were related to  
25 527 restricted mobility among married adolescent girls. Furthermore, religious beliefs  
26 528 substantially limited their autonomy in making decisions about contraceptive use. This  
27 529 finding of religious restrictions is in agreement with a previous study in Bangladesh [7].  
28 530 In contrast, in another study conducted in Syria, religious beliefs did not emerge as a  
29 531 barrier to reproductive decisions [28].

30 532  
31 533 Limited access to information about the benefits and methods of family planning had  
32 534 multiple intrapersonal-level effects. It contributed to fear of and misconception about  
33 535 the side effects of contraceptives. It also led to low awareness about the risks involved  
34 536 in adolescent pregnancy. Some married adolescent girls were unaware of free family  
35 537 planning services provided at government healthcare facilities. Fear of the side effects  
36 538 has been recognized as a barrier to contraceptive use in India [4], Bangladesh [7,8,29],  
37 539 and Iran [27]. Dropping out of school may have limited their opportunities to learn  
38 540 about sexual and reproductive health issues and to expand their social networks. The  
39 541 findings of this study support existing evidence that shyness in discussing family  
40 542 planning with husbands and healthcare providers impedes access to family planning  
41 543 services in Asian countries [4,7,9,30].

42 544  
43 545 In addition to the intrapersonal-level factors, supply-side barriers (e.g., a lack of privacy  
44 546 and confidentiality, the unfriendliness of healthcare providers) may have rendered them  
45 547 reluctant to seek contraceptives. Issues related to commodity insecurity, distance, and  
46 548 transport did not seem to influence contraceptives-seeking behaviors in this study.  
47 549 Health systems-level factors (e.g., a lack of privacy and confidentiality, the  
48 550 unfriendliness of health care providers) have been found to be contributing factors for  
49 551 contraceptive nonuse among married adolescent girls in Lao People's Democratic  
50 552 Republic [9].  
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6 554 The convergent results from triangulation across multiple sources (i.e., six different  
7 555 groups) and two data collection methods painted a complex and comprehensive portrait  
8 556 of the barriers to contraceptive use and causes of adolescent childbearing. However, the  
9 557 findings should be interpreted within the confines of several limitations of this study.  
10 558 First, a convenience sample was recruited from a single district in Nepal. Therefore, the  
11 559 findings may not be transferable to broader populations. Second, the participants may  
12 560 have felt inhibited to share their personal experiences candidly, especially those that  
13 561 pertain to sensitive subjects, in the presence of an interviewer. For example, they may  
14 562 have felt uncomfortable reporting other prevalent, albeit extremely stigmatized  
15 563 experiences (e.g., abuse and neglect) that influence contraceptive use. In the present  
16 564 study, efforts were made to obtain in-depth data by interviewing in a private space,  
17 565 establishing rapport with the participants, and maintaining confidentiality. Third, due to  
18 566 lack of respondent validation, the possibility of misinterpreting the meaning of what the  
19 567 respondent said could not be ruled out. Fourth, the relationships shown in Figure 2 are  
20 568 intended to be an illustrative set of relationships, rather than an exhaustive set. Minor  
21 569 linkages are not necessarily reflected in the diagram. Finally, the meanings embedded  
22 570 within participants' responses might have been lost or distorted during translation from  
23 571 Nepali to English. To minimize this problem, the interviewers checked the accuracy of  
24 572 the translated texts for errors and omissions. Despite these limitations, the strengths of  
25 573 this study include its comprehensive approach guided by the SEM, triangulation across  
26 574 multiple sources and methods, which enabled the collection of rich and detailed data,  
27 575 and other strategies for establishing validity.  
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## 32 577 **CONCLUSIONS AND PROGRAMMATIC IMPLICATIONS**

33 578  
34 579 The present findings delineate the mechanism of contraceptive nonuse and adolescent  
35 580 pregnancy in the study setting. In-depth accounts of a range of individuals demonstrated  
36 581 that the decision to postpone childbearing is not merely the personal choice of an  
37 582 individual or a couple, highlighting the importance of targeting families and  
38 583 communities in addition to adolescent girls and couples. Expanding access to  
39 584 comprehensive sexuality education to enhance girls' knowledge and demand for sexual  
40 585 and reproductive health may not be enough to prevent adolescent pregnancy. Instead,  
41 586 the present findings underscore the need to challenge restrictive socio-cultural norms so  
42 587 that adolescent girls become empowered to exercise greater control over contraceptive  
43 588 use. Community support and collective actions are needed to address the root causes  
44 589 that have been identified in this study. Men and boys must be engaged to challenge and  
45 590 transform gender norms and stereotypes relating to childbearing and family planning  
46 591 and to address negative effects that these norms and stereotypes can have on women,  
47 592 girls, family, and communities. Reproductive health programs and interventions should  
48 593 be culturally sensitive and context-specific and aim to reinforce women's reproductive  
49 594 rights and gender equality. Adopting human rights-based approaches to adolescent  
50 595 sexual and reproductive health is essential to ensure women's autonomy in exercising  
51 596 their reproductive rights by determining when to have a child and how many children to  
52 597 have.  
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## 54 599 **REFERENCES**

55 600 1. Guttmacher Institute. Investing in Adolescents' Sexual and Reproductive Health in  
56  
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- 1  
2  
3  
4  
5 601 Low- and Middle-Income Countries. New York: Guttmacher Institute; 2020.  
6  
7  
8 602 2. World Health Organization (WHO). Why is giving special attention to adolescents  
9 603 important for achieving Millennium Development Goal 5? Geneva: WHO; 2008.  
10 604 Available:  
11 605 [https://www.who.int/maternal\\_child\\_adolescent/events/2008/mdg5/adolescent\\_pre](https://www.who.int/maternal_child_adolescent/events/2008/mdg5/adolescent_pre_g.pdf?ua=1)  
12 606 [g.pdf?ua=1](https://www.who.int/maternal_child_adolescent/events/2008/mdg5/adolescent_pre_g.pdf?ua=1)  
13  
14 607 3. Sully E, Biddlecom A, Darroch JE, Riley T, Ashford LS, Lince-Deroche N, et al.  
15 608 Adding It Up: Investing in Sexual and Reproductive Health 2019. New York:  
16 609 Guttmacher Institute; 2020.  
17  
18  
19 610 4. Ghule M, Raj A, Palaye P, Dasgupta A, Nair S, Saggurti N, et al. Barriers to use  
20 611 contraceptive methods among rural young married couples in Maharashtra, India:  
21 612 Qualitative findings. *Asian J Res Soc Sci Humanit.* 2015;5: 18–33.  
22  
23 613 5. Cherri Z, Cuesta JG, Rodriguez-Llanes J, Guha-Sapir D. Early marriage and  
24 614 barriers to contraception among Syrian refugee women in Lebanon: a qualitative  
25 615 study. *International Journal of Environmental Research and Public Health.*  
26 616 2017;14: 836.  
27  
28  
29 617 6. McClendon KA, McDougal L, Ayyaluru S, Belayneh Y, Sinha A, Silverman JG, et  
30 618 al. Intersections of girl child marriage and family planning beliefs and use:  
31 619 qualitative findings from Ethiopia and India. *Cult Health Sex.* 2018;20: 799–814.  
32  
33 620 7. Shahabuddin ASM, Nöstlinger C, Delvaux T, Sarker M, Bardaji A, Brouwere VD,  
34 621 et al. What influences adolescent girls' decision-making regarding contraceptive  
35 622 methods use and childbearing? A qualitative exploratory study in Rangpur district,  
36 623 Bangladesh. *PLoS One.* 2016;11: e0157664.  
37  
38  
39 624 8. Henry EG, Lehnertz NB, Alam A, Ali NA, Williams EK, Rahman SM, et al.  
40 625 Sociocultural factors perpetuating the practices of early marriage and childbirth in  
41 626 Sylhet District, Bangladesh. *Int Health.* 2015;7: 212–217.  
42  
43  
44 627 9. Sychareun V, Vongxay V, Houaboun S, Thammavongsa V, Phummavongsa P,  
45 628 Chaleunvong K, et al. Determinants of adolescent pregnancy and access to  
46 629 reproductive and sexual health services for married and unmarried adolescents in  
47 630 rural Lao PDR: a qualitative study. *BMC Pregnancy Childbirth.* 2018;18: 219.  
48  
49 631 10. Maharjan B, Rishal P, Svanemyr J. Factors influencing the use of reproductive  
50 632 health care services among married adolescent girls in Dang District, Nepal: a  
51 633 qualitative study. *BMC Pregnancy and Childbirth.* 2019;19.  
52  
53 634 11. Ministry of Health (Nepal), New ERA, Micro International Inc. Nepal  
54 635 Demographic and Health Survey 2016. Kathmandu, Nepal: Ministry of Health,  
55 636 Nepal; 2017.  
56  
57  
58 637 12. United Nations Department of Economic and Social Affairs. World Fertility 2019.  
59 638 New York; 2020. Available:  
60

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6 639 [https://www.un.org/en/development/desa/population/publications/pdf/fertility/Wor](https://www.un.org/en/development/desa/population/publications/pdf/fertility/World_Fertility_2019.pdf)  
7 640 [ld\\_Fertility\\_2019.pdf](https://www.un.org/en/development/desa/population/publications/pdf/fertility/World_Fertility_2019.pdf)  
8  
9 641 13. Poudel S, Upadhaya N, Khatri RB, Ghimire PR. Trends and factors associated with  
10 642 pregnancies among adolescent women in Nepal: pooled analysis of Nepal  
11 643 Demographic and Health Surveys (2006, 2011 and 2016). *PLoS One*. 2018;13:  
12 644 e0202107.
- 13  
14 645 14. Godha D, Hotchkiss DR, Gage AJ. Association between child marriage and  
15 646 reproductive health outcomes and service utilization: a multi-country study from  
16 647 South Asia. *J Adolesc Health*. 2013;52: 552–558.
- 17  
18 648 15. Raj A, Saggurti N, Balaiah D, Silverman JG. Prevalence of child marriage and its  
19 649 effect on fertility and fertility-control outcomes of young women in India: a cross-  
20 650 sectional, observational study. *Lancet*. 2009;373: 1883–1889.
- 21  
22 651 16. Kamal SMM. Decline in child marriage and changes in its effect on reproductive  
23 652 outcomes in Bangladesh. *J Health Popul Nutr*. 2012;30: 317–330.
- 24  
25 653 17. Khanal DR, Pandey PR, Sharma B. Nepal Human Development Report 2020.  
26 654 Kathmandu, Nepal: Government of Nepal and United Nations Development  
27 655 Programme; 2020.
- 28  
29 656 18. Central Bureau of Statistics (Nepal). National Population and Housing Census  
30 657 2011. Kathmandu, Nepal: Central Bureau of Statistics; 2012.
- 31  
32 658 19. Marshall C, Rossman GB. *Designing Qualitative Research*. Thousand Oaks: SAGE  
33 659 Publications; 2016.
- 34  
35 660 20. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health  
36 661 promotion programs. *Health Educ Q*. 1988;15: 351–377.
- 37  
38 662 21. Sallis JF, Owen N, Fisher EB. Ecological models of health behavior. In: Glanz K,  
39 663 Rimer BK, Viswanath K, editors. *Health Behavior and Health Education: Theory,*  
40 664 *Research, and Practice*. San Francisco, CA, US: Jossey-Bass, xxxiii; 2008. pp.  
41 665 465–485.
- 42  
43 666 22. Graneheim UH, Lundman B. Qualitative content analysis in nursing research:  
44 667 concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today*.  
45 668 2004;24: 105–112.
- 46  
47 669 23. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual*  
48 670 *Health Res*. 2005;15: 1277–1288.
- 49  
50 671 24. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative  
51 672 research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual*  
52 673 *Health Care*. 2007;19: 349–357.
- 53  
54 674 25. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting

- 1  
2  
3  
4  
5  
6 675 qualitative research: a synthesis of recommendations. *Acad Med.* 2014;89: 1245–  
7 676 1251.
- 8  
9 677 26. Maxwell JA. *A realist approach to qualitative research.* Thousand Oaks: SAGE  
10 678 Publications; 2012. pp. 585–586.
- 11  
12 679 27. Mardi A, Ebadi A, Shahbazi S, Esmaelzade Saeieh S, Behboodi Moghadam Z.  
13 680 Factors influencing the use of contraceptives through the lens of teenage women: a  
14 681 qualitative study in Iran. *BMC Public Health.* 2018;18: 202.
- 15  
16 682 28. Hessini L. Abortion and Islam: policies and practice in the Middle East and North  
17 683 Africa. *Reprod Health Matters.* 2007;15: 75–84.
- 18  
19  
20 684 29. Schuler SR, Bates LM, Islam F, Islam MK. The timing of marriage and  
21 685 childbearing among rural families in Bangladesh: choosing between competing  
22 686 risks. *Soc Sci Med.* 2006;62: 2826–2837.
- 23  
24 687 30. Barua A, Kurz K. Reproductive health-seeking by married adolescent girls in  
25 688 Maharashtra, India. *Reprod Health Matters.* 2001;9: 53–62.

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### 692 **Abbreviations**

693 COREQ: criteria for reporting qualitative research; FCHVs: female community health  
694 volunteers; FP: family planning; IDIs: in-depth interviews; IQR: interquartile range; KIIs:  
695 key informant interviews; LMIC: low- and middle-income countries; SEM: socio-  
696 ecological model

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707 2018).

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### 709 **Consent for publication**

710 Not applicable.

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### 712 **Conflicts of interests**

713 The authors declare that they have no competing interests.

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### 715 **Data Availability Statement**

716 The data generated during the present study are not publicly available due to restrictions

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6 717 (e.g., their containing information that could compromise the privacy of research  
7 718 participants) but are available from the corresponding author on reasonable request.  
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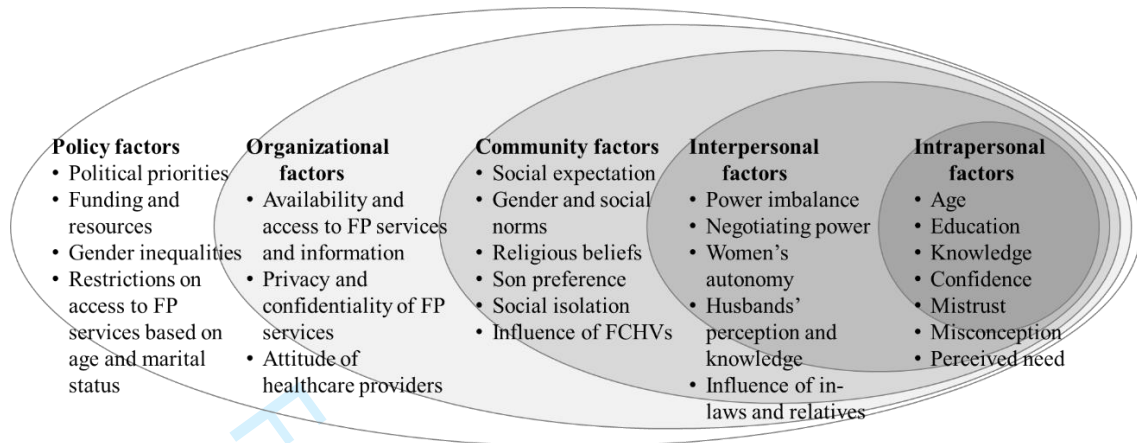
9 720 **Authors' contributions**

10 721 KS conceived and designed the study, analyzed the data, and wrote the draft manuscript.  
11 722 NK jointly analyzed the data. NK, RRC, KICO, AT, and MJ contributed to  
12 723 interpretation of the results and made critical suggestions for revisions to the  
13 724 manuscript. MJ supervised the study. All authors read and approved the final  
14 725 manuscript.  
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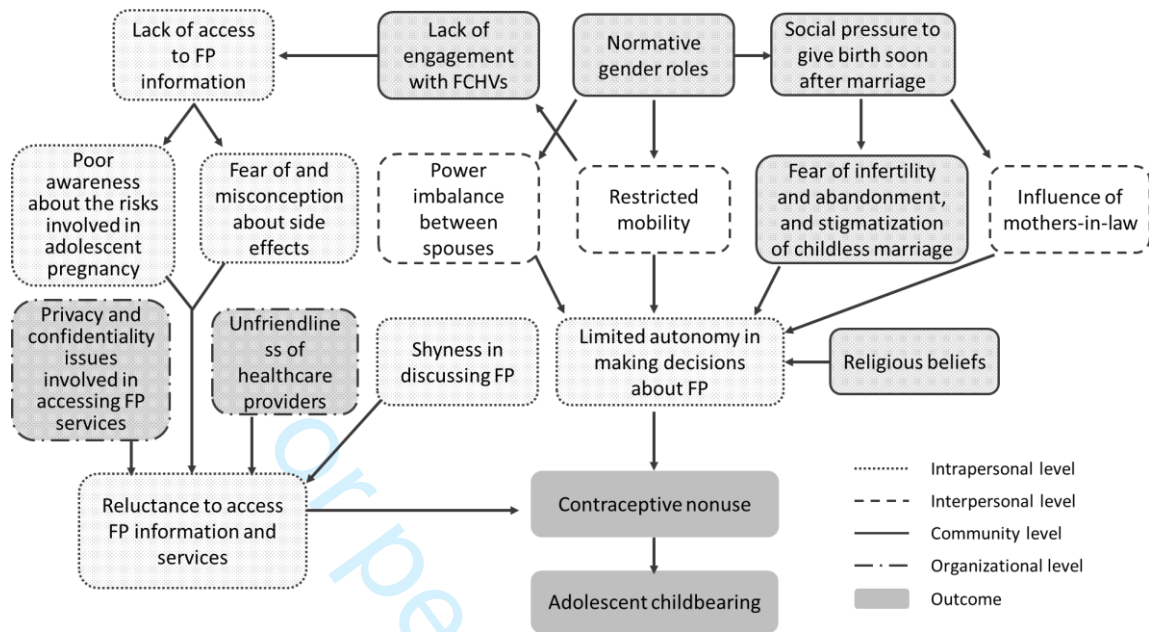




**Figure 1.** Conceptual framework adapted from on the socio-ecological model to identify the causes of contraceptive nonuse and adolescent pregnancy

Note: adapted from McLeroy et al. (1988) [20]

FP: family planning; FCHVs: female community health volunteers



**Figure 2.** A diagram of hypothetical relationships among the emergent factors  
 Note: There was no relevant findings on policy-level factors.

## S1 Topic guides (English)

### Topic Guide for Married Adolescent Girls

<b>Intrapersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you know that free family planning services are available in your municipality?</li> <li>• Do you know where to access free family planning services?</li> <li>• Which contraceptive methods do you know?</li> <li>• How do you perceive family planning services?</li> <li>• Have you ever used any contraceptive method?</li> <li>• Do you perceive the need for family planning services and information?</li> <li>• Do you feel shy to seek family planning services and information?</li> <li>• What challenges do you face in seeking family planning services?</li> <li>• Do you fear side effects of contraceptive use?</li> </ul>
<b>Interpersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you discuss with your husband when to have a child and how many children to have?</li> <li>• Do you feel comfortable to negotiate contraceptive use with your husband?</li> <li>• Who has the power to make decision regarding whether to use contraceptives?</li> <li>• Does your husband agree or disagree to use contraceptives?</li> <li>• Do you have a final say on contraceptive use?</li> <li>• Do you perceive that there is power imbalance in terms of decision-making regarding family planning between you and your husband?</li> <li>• Do your mother-in-law or sisters-in-law influence your decision-making about contraceptive use?</li> <li>• Have you heard of your mother-in-law's or sisters-in-law's experience of using family planning services?</li> </ul>
<b>Community factors</b>	<ul style="list-style-type: none"> <li>• Is there social consensus in your community that women should become pregnant soon after marriage?</li> <li>• Did you feel pressure to become pregnant soon after marriage? If so, who did you feel pressure from?</li> <li>• Has your religion something to do with non-use of contraceptives after marriage?</li> <li>• Do you sometimes exchange information about family planning with your friends?</li> <li>• Do FCHVs in this municipality discuss family planning services with young women like you?</li> </ul>
<b>Organizational factors</b>	<ul style="list-style-type: none"> <li>• Are local health care providers supportive of providing contraceptives to young women like you?</li> <li>• Are they friendly to young women like you?</li> <li>• Do you feel your privacy and confidentiality are maintained at a nearby health facility?</li> <li>• How long does it take to get to a nearby health facility providing family planning services?</li> </ul>

	<ul style="list-style-type: none"><li>• Is there local transportation available to get to a nearby health facility providing family planning services?</li><li>• Would you need a permission from your husband if you go out to a health facility?</li></ul>
<b>Policy factors</b>	<ul style="list-style-type: none"><li>• Is there any restriction of family planning services on age?</li><li>• Is there any restriction of family planning services on marital status?</li></ul>

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## Topic Guide for Husbands of Married Adolescent Girls

<b>Intrapersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you know that free family planning services are available in your municipality?</li> <li>• Do you know where to access free family planning services?</li> <li>• Which contraceptive methods do you know?</li> <li>• How do they perceive family planning services?</li> <li>• Do you perceive the need for family planning services and information?</li> <li>• Do you feel shy to seek family planning commodity (condom) and information?</li> <li>• What challenges do you face in seeking family planning services?</li> <li>• Do you fear side effects of contraceptive use?</li> </ul>
<b>Interpersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you discuss with your wife when to have a child and how many children to have?</li> <li>• Do you feel comfortable to discuss contraceptive use with your wife?</li> <li>• Who has the power to make decision regarding whether to use contraceptives?</li> <li>• Do you have a final say on contraceptive use?</li> <li>• Do you perceive that there is power imbalance between you and your wife?</li> <li>• Do your parents or anyone else influence your decision-making about contraceptive use?</li> <li>• Have you heard of anyone's experience of using family planning services?</li> </ul>
<b>Community factors</b>	<ul style="list-style-type: none"> <li>• Is there social consensus in your community that women should become pregnant soon after marriage?</li> <li>• Did you feel pressure to get your wife pregnant soon after marriage? If so, who did you feel pressure from?</li> <li>• Has your religion something to do with non-use of contraceptives after marriage?</li> <li>• Do you sometimes exchange information about family planning with your friends?</li> <li>• Do FCHVs in this municipality discuss family planning services with men like you?</li> </ul>
<b>Organizational factors</b>	<ul style="list-style-type: none"> <li>• Are local health care providers supportive of providing condoms?</li> <li>• Are they friendly to you when you go there to seek condoms?</li> <li>• Do you feel your privacy and confidentiality are maintained at a nearby health facility?</li> <li>• How long does it take to get to a nearby health facility providing condoms?</li> <li>• Is there local transportation available to get to a nearby health facility providing family planning services?</li> </ul>

## Topic Guide for Mothers-in-law of Married Adolescent Girls

<b>Intrapersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you know that free family planning services are available in your municipality?</li> <li>• Do you know where to access free family planning services?</li> <li>• Which contraceptive methods do you know?</li> <li>• How do they perceive family planning services?</li> <li>• What challenges do you think young couples face in seeking family planning services?</li> </ul>
<b>Interpersonal factors</b>	<ul style="list-style-type: none"> <li>• Do you think your daughter-in-law should discuss family planning with her husband?</li> <li>• Did you feel comfortable to negotiate contraceptive use with your husband?</li> <li>• In your opinion, who should decide when to have a child and how many children to have</li> <li>• In your opinion, who should decide whether to use contraceptives?</li> <li>• Do you think your daughter-in-law should use contraceptives?</li> <li>• Are you influential in decision making about contraceptive use of your daughter-in-law?</li> <li>• Have you ever shared with your daughter-in-law your experience of using family planning services?</li> </ul>
<b>Community factors</b>	<ul style="list-style-type: none"> <li>• Is there social consensus in your community that women should become pregnant soon after marriage?</li> <li>• When you were young, did you feel pressure to become pregnant soon after marriage? If so, who did you feel pressure from?</li> <li>• Do FCHVs in this municipality discuss family planning services with young couples?</li> </ul>

## Topic Guide for Health Care Providers, Health Coordinators and FCHVs

<b>Community factors</b>	<ul style="list-style-type: none"> <li>• Is there social consensus in this community that women should become pregnant soon after marriage?</li> <li>• Has your religion something to do with non-use of contraceptives after marriage?</li> <li>• Do FCHVs in this municipality discuss family planning services with young couples?</li> </ul>
<b>Organizational factors</b>	<ul style="list-style-type: none"> <li>• What is a major challenge for local women especially when seeking family planning services in this municipality?</li> <li>• Do women in this municipality have to seek permission from their husband if they go out to a health facility?</li> <li>• What is a major challenge in providing family planning services in your municipality or health facility? (Availability of commodities and equipment, training for nurses/ANM)</li> <li>• What is your concern in family planning programme in this municipality? (budget, planning, leadership/governance, health information, supplies, availability and capacity of health workers)</li> <li>• Are there any other issues that one should be aware of when understanding access to family planning services in this municipality?</li> </ul>
<b>Policy factors</b>	<ul style="list-style-type: none"> <li>• Is there any restriction of family planning services on age?</li> <li>• Can young people below the age of 18 receive family planning services in this municipality or facility as they wish?</li> <li>• Is there any restriction of family planning services on marital status?</li> <li>• Can unmarried couples receive family planning services in this municipality or facility as they wish?</li> </ul>

**Supplementary 2:** Consolidated criteria for reporting qualitative studies (COREQ): a 32-item checklist

**Title:** Multilevel factors influencing contraceptive use and childbearing among adolescent girls in Bara district of Nepal: A qualitative study using the social-ecological model

**Authors:** Kazutaka Sekine, Nirajan Khadka, Rogie Royce Carandang, Ken Ing Cherng Ong, Anand Tamang, and Masamine Jimba

Topic	Guide questions/description	Response
<b>Domain 1: Research team and reflexivity</b>		
<i>Personal Characteristics</i>		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Five research assistants (four women and one man) hired for this research conducted the interviews. KS and NK supervised the data collection process.
2. Credentials	What were the researcher's credentials? E.g., Ph.D., MD	Ph.D., MSc, MA, MD
3. Occupation	What was their occupation at the time of the study?	PhD student, Professor, Assistant Professor, and Director of an NGO
4. Gender	Was the researcher male or female?	All the concerned researchers are male. Four of the local research assistants involved in data collection are female and one male.
5. Experience and training	What experience or training did the researcher have?	KS, RRC, AT, and MJ have experiences in qualitative research.
<i>Relationship with participants</i>		
6. Relationship established	Was a relationship established before study commencement?	None of the concerned researchers had relationships with the participants until study commencement.
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g., personal goals, reasons for doing the research	None of the participants had contact with the concerned researchers before this study. The aim, objectives, and procedures of the study was explained to the participants before participation.
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g., bias, assumptions, reasons, and interests in the research topic	All of the assistants have a bachelor's degree in public health or sociology. They speak the local language (i.e., Bhojpuri) and are experienced in qualitative research. Before data collection, they were trained to avoid the biases that typically interfere with the collection of qualitative data and to address ethical considerations.



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**Domain 2: Study design**


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*Theoretical framework*

9. Methodological orientation and Theory      What methodological orientation was stated to underpin the study? e.g., grounded theory, discourse analysis, ethnography, phenomenology, content analysis      The socio-ecological model was adopted as the theoretical framework that guided the development of research tools. Also, a directed approach to content analysis was employed for data analysis in this study.

*Participant selection*

10. Sampling      How were participants selected? e.g., purposive, convenience, consecutive, snowball      Convenience sampling

11. Method of approach      How were participants approached? e.g., face-to-face, telephone, mail, email      Door-to-door visits.

12. Sample size      How many participants were in the study?      70 participants (60 for IDIs and 10 for KIIs)

13. Non-participation      How many people refused to participate or dropped out? Reasons?      None of the participants refused to participate or dropped out in the study.

*Setting*

14. The setting of data collection      Where was the data collected? e.g., home, clinic, workplace      IDIs and KIIs were conducted in a private space that was chosen by the participants and at a time that was convenient to them.

15. Presence of nonparticipants      Was anyone else present besides the participants and researchers?      Nobody

16. Description of sample      What are the important characteristics of the sample? e.g., demographic data, date      Characteristics of the IDI participants are provided in Table 2.

*Data collection*

17. Interview guide      Were questions, prompts, guides provided by the authors? Was it pilot tested?      Based on literature reviews, the authors developed the conceptual framework (Figure 1) that guided the development of research tools. For each group of the participants, a separate topic guide was developed and used. Prior to data collection, a topic guide was pretested on two married adolescent girls to determine the feasibility of the tool and refine the questions.

18. Repeat interviews      Were repeat interviews carried out? If yes, how many?      No.

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19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	All the IDIs and KIIs were audio-recorded and transcribed verbatim.
20. Fieldnotes	Were field notes made during and/or after the interview or focus group?	Field notes were made during the interviews.
21. Duration	What was the duration of the interviews or focus group?	The interviews lasted for about one hour.
22. Data saturation	Was data saturation discussed?	Yes. The sample size allowed the researchers to reach thematic saturation that is when no new information emerges.
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No.

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### Domain 3: Analysis and findings

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#### *Data analysis*

24. Number of data coders	How many data coders coded the data?	Two researchers (KS and NK) were responsible for coding.
25. Description of the coding tree	Did authors provide a description of the coding tree?	No.
26. Derivation of themes	Were themes identified in advance or derived from the data?	Themes were identified in advance based on the social-ecological model and literature reviews. However, new codes were given to any texts that could not be categorized with the initial coding scheme.
27. Software	What software, if applicable, was used to manage the data?	We used NVivo 9 (QSR International, Cambridge, MA) to facilitate coding, organization, searching for meaning units embedded within the English transcripts, and systematically compare the emergent categories and themes both within and across the cases.
28. Participant checking	Did participants provide feedback on the findings?	Respondent validation could not be conducted due to logistical constraints, and lack of personal information of the respondents.
<i>Reporting</i>		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g., participant number	Participant quotations are presented to illustrate themes.
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Consistency between the data presented and the findings is ensured in the article.

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4	31. Clarity of major themes	Were major themes clearly presented in the findings?	Yes, in the results section.
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7	32. Clarity of minor themes	Is there a description of diverse cases or a discussion on minor themes?	Relatively minor themes that are supported by a few participant quotations are included in the result section.
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12 Reference: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a  
13 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007;19(6):349-57.  
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