



# Maternal sexual empowerment and sexual and reproductive outcomes among female adolescents: Evidence from a cross-sectional study in Ecuador

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## ABSTRACT

**Background:** A vast literature has demonstrated that several mother-related variables are positively associated with their daughters' sexual and reproductive outcomes. One underexplored variable is sexual empowerment—a subdimension of empowerment. In this study, we explore if maternal sexual empowerment is predictive of adolescent daughters' outcomes like early sexual initiation, teenage pregnancy, and contraception use.

**Methods:** This study uses data from the 2018 National Health and Nutrition Survey of Ecuador (Ensanut), a cross-sectional survey in Ecuador that measures health and nutrition. We examine whether mothers' sexual empowerment—measured as a woman's autonomy in sexual relationships and her ability to turn down sex and demand contraception use from her partner—is predictive of sexual and reproductive outcomes among female adolescent children. Logistic regression was performed to test this association.

**Results:** Results showed that having a mother who lacked sexual empowerment increased the odds of early sexual initiation. Girls who had a mother who had a teenage birth were more likely to experience teenage pregnancy themselves.

**Conclusions:** Mothers may influence daughters' attitudes towards sex through their own demonstration of sexual empowerment. This research demonstrates that a lack of maternal sexual empowerment can be a risk factor of early sexual initiation, teenage pregnancy, and lack of contraception use among female adolescents. More research is needed to confirm the robustness of these results and analyze other forms of sexual empowerment.

**Limitations:** Other variables not present in the data, like domestic violence, can be used to understand the sexual activity of young females and maternal sexual empowerment. Social desirability and recall bias are also common forms of bias in surveys regarding sexual activity among adolescents.

## Introduction

### Background

Women's empowerment is usually referred to as a woman's ability to make decisions and control one's own well-being. It includes women's access to and control over family resources, freedom of movement, access to employment opportunities, and control over sexual relationships (Malhotra et al., 2002). Despite the detailed nature of studies on empowerment, the association between mothers' sexual empowerment and daughters' sexual decision-making has barely been explored in empirical research.

Peterson (2010) defines sexual empowerment as a woman's ability to influence the sexual behavior that occurs within her relationship and communicate her sexual desires. A large number of studies across several countries have found that mothers' characteristics, including educational attainment, marital status, and mother-child relationship are related to the sexual and reproductive outcomes of female adolescent children (e.g., McNeely et al., 2002; Miller et al., 2001; Newcomer & Udry, 1987). Daughters may subconsciously learn their relative standing and value as women in comparison to men by looking at their mothers' autonomy in sexual relationships. This implies that mothers may actually shape the sexual behavior of their daughters by serving as a role model through their own actions. Further exploration of this

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argument is important given the rapid changes in the value of women's labor and status (Paxton et al., 2020), and how these relate to their children's behavior.

Daughters of women who initiated sexual activity early and those who became teenage mothers have been found to be more likely to engage in early sexual activity and go through unintended pregnancy themselves (Johnson & Tyler, 2007; Kahn & Anderson, 1992). Aside from these findings, most recent research has focused on studying the connection between mothers' empowerment and daughters' risky sexual behavior. Gipson and Upchurch (2017) in the Philippines, for instance, found that mothers who were considered to be "well-kept"—a locally defined measure of empowerment—were more likely to have daughters who had not engaged in sexual activity. These findings suggest that there are more dimensions of women's empowerment that may impact intergenerational sexual and reproductive behaviors that are worth exploring.

### Objectives

The aim of this study is to examine whether mothers' sexual empowerment is predictive of sexual and reproductive outcomes among female adolescent children. Using a unique, intergenerational, and nationally representative dataset, this study explores the relationship between mothers' sexual empowerment and daughter's propensity to engage in early sexual initiation, have a teenage pregnancy, and/or use contraception when she is 16 years old. We hypothesized that daughters of mothers with higher sexual empowerment, as compared to their peers, will have a lesser likelihood of early sexual initiation, teenage pregnancy, and will be more likely to use contraception. In addition, to rule out any possible confounding variables, the models include daughter-related characteristics, as well as maternal and household features like mothers' educational attainment and household structure.

Ecuador was chosen as the setting for the present study. It is a country that despite its considerable improvements over the past years regarding female educational attainment and labor participation (The World Bank, 2012), has one of the highest teenage pregnancy rates in Latin America (UNICEF et al., 2016). Research has shown that access to schooling and labor opportunities influences women's attitudes towards marriage and causes them to delay motherhood by increasing sexual agency and raising the opportunity cost of childbearing (Duflo et al., 2015; Jensen, 2012). Ecuador, however, has fallen behind neighboring countries in reducing teenage pregnancy rates and has even undergone increments in the number of teenage mothers in some year periods (e.g., from 2013 to 2016) (Ministerio de Educacion del, 2018; UNICEF et al., 2016). Goicolea et al. (2009) argue that women's sexual agency in Ecuador is curtailed by social norms, such as associating condoms with promiscuity and infidelity, and a gender structure that encourages submissive, dependent, and obedient attitudes in women. These features make Ecuador an interesting setting that allows for the examination of novel dimensions of empowerment in a context where social norms potentially limit this power significantly.

### Methods

#### Study design and setting

For this study, we applied a cross-sectional design. This study used data from the 2018 National Health and Nutrition Survey of Ecuador (Ensanut)—a survey conducted every five years by the Ecuadorian National Institute of Statistics and Census (INEC). Its goal is to assess the health and nutritional status of adults and children in Ecuador. The survey was conducted using a conglomerate probability sampling and the population target was all household members in the 24 provinces of Ecuador (mainland Ecuador and the Galapagos Islands). 80% of participants were interviewed from November 2018 to January 2019. The remaining 20% were interviewed from June to July 2019. The survey

gathered data from 43,311 households, totaling a number of 168,747 subjects. Data about the sexual health of women was gathered for all those between 12 and 49 years old.

#### Participants

The sample was restricted to girls who were 16 years old at the time of the survey and their mothers. Daughters had to live with their mothers, as the survey only captured data of the people residing within the same household. Additionally, because data regarding sexual health was collected for women under 49, only mothers who were below this age threshold were included in the final sample.

Even though the World Health Organization defines early sexual initiation as having sexual intercourse at age 14 or younger (as cited by Lee et al., 2018), studies on sexual and reproductive health use inconsistent age cutoffs to demarcate early sexual initiation (Stöckl et al., 2013). Thus, there is no clear benchmark on the exact age cutoff of early sexual initiation. In this study, early sexual initiation was defined as having intercourse at age 16 or younger. There are several benefits of using this cutoff. First, it allows for easy comparison of results among studies. According to a systematic review by Stöckl et al. (2013) on early sexual initiation and HIV infection among women in Sub-Saharan Africa, several studies use having intercourse at age 16 or younger as the cutoff of early sexual initiation. Second, it reduces risks of social desirability and recall bias as sexual activity before age 15 is frequently misreported by adolescents (Neal & Hosegood, 2015).

#### Variables and measurement

**Dependent variables.** Three sexual outcomes were observed in the analysis: early sexual initiation, teenage pregnancy, and contraception use. Daughters were asked whether they had ever had sexual intercourse and whether they had ever been pregnant. Teenage pregnancy included any who had a pregnancy history regardless of the outcome. Respondents who reported having had intercourse were then asked if they had used any contraception method during their first intercourse. For each question, girls who answered "no" were coded as 0, while those who answered "yes" were coded as 1.

**Main explanatory variables.** The main explanatory variables were mothers' sexual empowerment and whether the mothers had experienced teenage pregnancy.

**Mothers' sexual empowerment.** Three questions in the survey were used to measure sexual empowerment. 1) Can you say "no" to your partner whenever you do not want to have sexual intercourse. 2) Are you using any form of contraception? If not, what is the reason (e.g., partner opposes, religious beliefs, desiring pregnancy, etc.)? 3) If you requested your partner to use a condom, how do you think he would react? If mothers were either unable to turn down sex, did not use contraception because their partner opposed, or believed their partner would react angrily if requested to use condom, they were labeled as "lacking sexual empowerment". A similar measure of sexual empowerment has been previously used in a study by Crissman et al. (2012) on contraception use by married women in Ghana.

**Mothers had a teenage birth.** Mothers' age at first birth was dichotomized into having had a birth at or before age 19 versus having their first birth at age 20 or later. We included mothers' age at first birth to account for early sexual empowerment. Sexual empowerment is conceived as the ability to make safe and informed decisions to prevent and modify risky sexual behaviors such as teenage pregnancy (Peterson, 2010). It also involves the assertiveness to protect themselves from coercive sexual experiences (Lamb & Peterson, 2012). Jewkes et al. (2001) showed that young mothers are generally characterized for being involved in unequal power relations, being forced to engage in sexual activities, and being physically abused by their partners. Dickson et al. (1998), conversely, found that rates of coercion increase the younger the age at first intercourse. This evidence suggests that mothers who had

intercourse at a young age and who experienced early childbearing may exhibit low sexual empowerment.

**Mother-related controls.** These control variables included mothers' age, being employed or not, marital status, and educational attainment. Mothers were classified as married, cohabiting, or non-partnered. Mothers' employment and marital status were used to control for household structure and stability. Father absence has been found to be associated with women's sexual outcomes (Ellis et al., 2003). Compared to being reared in a stable household with two biological parents, being raised in a single-mother household is strongly correlated with early sexual activity and teenage pregnancy (Newcomer & Udry, 1987). Regarding educational attainment, mothers were classified as having no formal education or having completed primary, secondary, or tertiary education. Evidence shows that children of more educated mothers are more likely to delay sexual onset and pregnancy (Jordahl & Lohman, 2009; McNeely et al., 2002).

**Daughter-related controls.** These measures consisted of being enrolled in school or not, knowledge about period at first menstruation, and source of knowledge about sexuality. A systematic review by Pradhan et al. (2015) shows that having low levels of education or no education is one of the most common risk factors associated with early childbearing in developing countries, so this study considers a lack of school enrollment as a risk factor for teenage pregnancy. They also discussed the influence of specific knowledge about sexuality on reproductive health and avoiding unwanted pregnancies; and found that lack of sexual education was associated with higher risk of pregnancy. They found that girls commonly used peers as sources of information on sexual matters but that those peers were generally equally uninformed. Sampled girls were asked if they had ever received information about contraception methods. If they said "yes", they had to report the source from which they had received the most information (family, school, and other sources such as peers and the internet). They were also asked if they were aware of what was happening to their body during their first period. This measure was included to account for early knowledge about sexuality.

**Household-related controls.** Daughters were classified according to their ethnicity (white and mestizo Ecuadorians vs. ethnic minority Ecuadorians), geographic area (urban vs. rural), and internet access (having no access vs. having access). Internet access and most recent (monthly) household income in US dollars were included to control for economic status and poverty level. Pradhan et al. (2015) shows that adolescents from low socioeconomic backgrounds are more likely to have experienced pregnancy than those from more advantaged backgrounds. Similarly, they proved that lack of employment opportunities increased the risk of pregnancy among girls. Evidence also suggests that differences in ethnicity and geographic area play an essential role in female adolescents' sexual behavior. For instance, Benda and Corwyn (1998) found that compared to rural white Americans, rural black Americans brought up by single mothers were less likely to engage in sexual activity.

### Bias

This study, like most research on sexual health, is not exempt of risk of bias. Social desirability bias and recall bias have been found to be a common problem in surveys on sexual initiation, childbearing, and marriage by adolescents. Neal and Hosegood (2015) found several inconsistencies in the reporting of sexual outcomes among women born in the same year cohort but interviewed at different ages. They found that women aged 15–19 were much less likely to report marriages and first births before age 15 than were women from the same birth cohort when asked five years later at ages 20–24. These findings on reporting biases are one of key reasons why we decided to restrict the cutoff of early sexual initiation to 16 years.

### Study size

The initial sample contained data from 1636 16-year-old daughters. Because data from both mothers and daughters were required to conduct the analysis, 289 subjects were dropped because they did not live with their mothers. 232 additional subjects were dropped because their mothers' age was above the age threshold for which data were collected, leading to a preliminary sample of 1115 eligible subjects. Another 58 were dropped because their mothers' sexual health data were missing. 79 subjects were dropped because they did not provide information about their sexual activity. The final sample was made up of 978 daughters and their mothers.

### Statistical methods

Before conducting the primary analysis, we examined the frequency distribution of the variables of interest for the entire sample: daughters who had and had not had sexual intercourse, daughters who had and had not been pregnant, and daughters who had and had not used contraception during their first time having intercourse. Table 1 shows the percentage and mean levels for all explanatory variables and controls in the analysis. Differences across groups were tested using the chi-square and *t*-test for categorical and continuous variables, respectively.

Logistic regression was performed to test the association between mothers' sexual empowerment and their daughters' sexual outcomes (early sexual initiation, teenage pregnancy, and contraception use). Table 2 shows the odds ratio and 95% confidence interval of the variables of interest, main explanatory variables, and controls. Mother-related controls included mothers' age, being employed or not, marital status, and educational attainment. Daughter-related controls included being enrolled in school or not, knowledge about period at first menstruation, and source of knowledge about contraception. Survey weights were accounted for in both the descriptive and regression results in a separate set of analyses (not shown here). However, we show only the unweighted results as the weighted results change trivially in comparison to the former.

### Missing data

Statistical analysis was performed using complete case analysis. Missing data from eligible subjects were due to mothers or daughters not being at home at the time the surveyor visited the household or that they were not willing to answer the questions regarding sexual activity. Nevertheless, these only accounted for 12.3% of eligible subjects (137 subjects out of 1115). Logistic regression was used to identify any associations between non-response and socioeconomic and demographic characteristics. The odds of non-response by mothers decrease as their age increases ( $p < .01$ ) and if they are married ( $p < .1$ ) and increases if their daughter is not enrolled in school ( $p < .1$ ). On the other hand, the odds of non-response by daughters increase if they have no internet access ( $p < .1$ ). Despite these associations, non-response among daughters and mothers was not related to ethnicity, geographic area, income, and mothers' educational attainment.

### Results

As mentioned in the previous section, the preliminary sample was made up of 1115 eligible subjects who lived with their mothers and whose mothers' age was below the age threshold for which data were collected. 137 subjects were dropped because they either did not provide information about their sexual activity or their mothers' sexual health data were missing. Thus, the final sample contained data from 978 16-year-old daughters and their mothers. 16% ( $N = 159$ ) had had sexual intercourse and 7% ( $N = 69$ ) had been pregnant. Among the 16% of those early sexual initiators, 46% ( $N = 73$ ) used contraception during their first time having intercourse. 8% ( $N = 79$ ) of daughters were not

**Table 1**  
Percentage and mean levels of explanatory variables by group.

	Total (n = 978)	Daughters' sexual outcomes								
		Early sexual initiation (n = 978)			Teenage pregnancy (n = 978)			Contraception use (n = 159)		
		Yes	No	p value	Yes	No	p value	Yes	No	p value
<i>Daughters' sexual outcomes</i>										
Early sexual initiation	0.16									
Teenage pregnancy	0.07									
Contraception use	0.46									
<i>Main explanatory variables</i>										
Mother lacks sexual empowerment	0.10	0.14	0.09	0.086 *	0.13	0.10	0.469	0.12	0.15	0.782
Mother had a teenage birth	0.51	0.67	0.48	0.000 ***	0.70	0.50	0.003 ***	0.64	0.70	0.581
<i>Mother-related variables</i>										
Age	39.61	39.01	39.73	0.065 *	38.68	39.68	0.075 *	38.89	39.10	0.761
Employed	0.60	0.68	0.59	0.043 **	0.65	0.60	0.474	0.67	0.69	0.977
Non-partnered	0.21	0.25	0.20	0.143	0.20	0.21	1.000	0.29	0.22	0.434
Cohabiting	0.29	0.35	0.28	0.105	0.41	0.28	0.038 **	0.34	0.35	1.000
Married	0.51	0.40	0.53	0.006 ***	0.39	0.51	0.066 *	0.37	0.43	0.541
No education	0.03	0.07	0.02	0.007 ***	0.09	0.03	0.018 **	0.01	0.12	0.026 **
Primary education	0.44	0.43	0.44	1.000	0.48	0.43	0.550	0.37	0.49	0.180
Secondary education	0.38	0.39	0.38	0.810	0.33	0.38	0.502	0.41	0.37	0.736
Tertiary education	0.15	0.11	0.16	0.098 *	0.10	0.16	0.285	0.21	0.02	0.001 ***
<i>Daughter-related variables</i>										
Not enrolled in school	0.08	0.26	0.05	0.000 ***	0.36	0.06	0.000 ***	0.15	0.36	0.005 ***
No knowledge about period	0.21	0.29	0.19	0.006 ***	0.32	0.20	0.024 **	0.19	0.37	0.020 **
<i>Daughters' knowledge about contraception</i>										
No knowledge	0.11	0.08	0.12	0.229	0.10	0.11	0.918	0.03	0.13	0.044 **
Knows from family	0.07	0.09	0.06	0.308	0.09	0.06	0.647	0.12	0.06	0.244
Knows from school	0.75	0.65	0.77	0.004 ***	0.57	0.76	0.001 ***	0.68	0.63	0.558
Knows from other sources	0.07	0.18	0.05	0.000 ***	0.25	0.06	0.000 ***	0.16	0.19	0.882
<i>Household-related variables</i>										
Ethnic minority	0.21	0.30	0.20	0.009 ***	0.26	0.21	0.414	0.15	0.42	0.000 ***
Rural area	0.40	0.42	0.40	0.776	0.38	0.40	0.755	0.26	0.55	0.000 ***
Internet access	0.43	0.30	0.46	0.000 ***	0.26	0.44	0.005 ***	0.45	0.17	0.000 ***
Household income	601.64	724.23	577.84	0.722	532.07	606.92	0.900	996.21	493.36	0.054 *

Note: p values for comparison of percentages using chi-square. p values for comparison of means using t-test. \*p < .1; \*\*p < .05; \*\*\*p < .01.

**Table 2**  
Odds ratio and 95% confidence interval from logistic regression models predicting daughters' sexual outcomes.

	Daughters' sexual outcomes					
	Early sexual initiation (n = 978)		Teenage pregnancy (n = 978)		Contraception use (n = 159)	
	OR	95% CI	OR	95% CI	OR	95% CI
<b>Unadjusted model without controls</b>						
Mother lacks sexual empowerment	1.58 *	0.93–2.61	1.38	0.62–2.75	0.78	0.30–1.9
Mother had a teenage birth	2.19 ***	1.53–3.15	2.27 ***	1.36–3.93	0.78	0.40–1.5
<b>Fully adjusted model with controls</b>						
Mother lacks sexual empowerment	1.72 *	0.96–2.97	1.57	0.67–3.4	0.74	0.19–2.7
Mother had a teenage birth	1.98 ***	1.29–3.08	1.74 *	0.92–3.3	0.57	0.22–1.4
<i>Mother-related variables</i>						
Age	0.99	0.95–1.04	0.97	0.91–1.0	1.03	0.93–1.1
Employed	1.56 **	1.03–2.39	1.47	0.82–2.7	0.70	0.27–1.8
Cohabiting (Reference = Non-partnered)	0.81	0.47–1.38	1.25	0.58–2.8	0.74	0.21–2.5
Married	0.72	0.44–1.19	1.16	0.55–2.6	0.43	0.13–1.3
Primary education (Reference = No education)	0.41 *	0.16–1.13	0.49	0.15–1.8	8.09 *	0.95–186.7
Secondary education	0.60	0.23–1.70	0.51	0.15–1.9	8.40 *	0.99–190.5
Tertiary education	0.51	0.17–1.62	0.62	0.14–2.9	34.82 **	2.57–1102.0
<i>Daughter-related variables</i>						
Not enrolled in school	8.58 ***	4.85–15.45	8.05 ***	4.16–15.6	0.51	0.19–1.3
No knowledge about period	1.59 **	1.01–2.49	1.70 *	0.90–3.1	0.77	0.31–1.9
<i>Daughters' knowledge about contraception</i>						
Knows from family (Reference = No knowledge)	4.88 ***	1.83–13.54	3.36 *	0.89–13.0	2.78	0.32–31.2
Knows from school	2.74 **	1.32–6.27	1.66	0.64–5.0	1.36	0.23–11.0
Knows from other sources	9.66 ***	4.02–24.89	8.06 ***	2.78–26.5	1.25	0.19–11.0
<i>Household-related variables</i>						
Ethnic minority	1.57 *	0.99–2.49	1.04	0.52–2.0	0.36 **	0.14–0.9
Rural area	0.81	0.52–1.25	0.56 *	0.29–1.0	0.58	0.25–1.4
Internet access	0.64 *	0.40–1.02	0.55 *	0.27–1.1	2.09	0.80–5.6
Household income	1.00	1.00–1.00	1.00	1.00–1.0	1.00	1.00–1.0

Note: \*p < .1; \*\*p < .05; \*\*\*p < .01.

enrolled in school, and 21% (N = 201) did not know what was happening to their bodies during their first period. 75% (N = 731) of all daughters had received information about contraception from school; 7% (N = 65) from family; and 7% (N = 72) from other sources; 11% of them (N = 110) had never received information.

10% (N = 96) of mothers lacked sexual empowerment and 51% (N = 503) had a teenage birth. The average age of mothers was 39.61 (SD = 4.49). 60% (N = 591) of mothers were employed and 51% (N = 464) were married. 3% (N = 31) of mothers had no education, 44% (N = 427) had attended primary school, 38% (N = 370) had attended secondary school, and 15% (N = 150) had attended tertiary school. Regarding household characteristics, 21% (N = 210) of daughters identified as ethnic minority, 40% (N = 393) lived in a rural area, and 43% (N = 421) had internet access. The average last household income in US dollars was 601.64 (SD = 4746.46).

### Descriptive results

Table 1 shows the percentage and mean levels for all variables considered in the analysis. Early sexual initiators were more likely to have mothers who reported lacking sexual empowerment ( $p < .1$ ), having had a teenage birth ( $p < .01$ ), being employed ( $p < .05$ ), and having no education ( $p < .01$ ) and were less likely to have mothers who were married ( $p < .01$ ). Early sexual initiators were also more likely to report not being enrolled in school ( $p < .01$ ), having no knowledge about period at first menstruation ( $p < .01$ ), knowing about contraception from other sources, including peers and the internet ( $p < .01$ ), belonging to an ethnic minority ( $p < .01$ ), and having no internet access ( $p < .01$ ). Girls with a history of pregnancy were more likely to have mothers who reported having become teenage mothers themselves ( $p < .01$ ), being unmarried ( $p < .1$ ), and having no education ( $p < .05$ ). Similar to early sexual initiators, they were more likely to report not being enrolled in school ( $p < .01$ ), having no knowledge about period at first menstruation ( $p < .05$ ), having no internet access ( $p < .01$ ), and knowing about contraception from other sources ( $p < .01$ ) as opposed to from school ( $p < .01$ ).

Regarding contraception use, girls who used contraception during their first time having intercourse were more likely to have mothers who reported having attended tertiary education ( $p < .01$ ). They were less likely to report not being enrolled in school ( $p < .01$ ) and more likely to report having knowledge about period at first menstruation ( $p < .05$ ). On the other hand, girls who did not use contraception were more likely to report having never received information about contraception ( $p < .05$ ), to belong to an ethnic minority ( $p < .01$ ), to live in a rural area ( $p < .01$ ), have no internet access ( $p < .01$ ), and have a lower household income ( $p < .1$ ).

### Regression results

Table 2 shows the odds ratio and 95% confidence interval of the main explanatory variables and controls from unadjusted and fully adjusted logistic regression models. Fully adjusted logistic regression shows that lacking sexual empowerment was predictive of early sexual initiation (odds ratio (OR): 1.72;  $p < .1$ ). Having a mother who had a teenage birth was associated with early sexual initiation (OR: 1.98;  $p < .01$ ) and teenage pregnancy (OR: 1.74;  $p < .1$ ). Mothers' sexual empowerment, however, was not significantly associated with contraception use in the model. Having an employed mother increased the odds of early sexual initiation (OR: 1.56;  $p < .05$ ) and having a mother who had attended primary school reduced the odds of early sexual initiation (OR: 0.41;  $p < .1$ ). Not being enrolled at school and having no knowledge about period at first menstruation were highly predictive of early sexual initiation (OR: 8.58;  $p < .01$ ; OR: 1.59;  $p < .05$ , respectively). Daughter's source of knowledge about contraception was strongly correlated with early sexual initiation. The odds of early sexual initiation increased significantly if daughters knew about contraception

from family or other sources, including peers and the internet (OR: 4.88;  $p < .01$ ; OR: 9.66;  $p < .01$ , respectively). Belonging to an ethnic minority and having internet access were also predictive of early sexual initiation (OR: 1.57;  $p < .01$ ; OR: 0.64;  $p < .1$ ). Teenage pregnancy was associated with not being enrolled in school (OR: 8.05;  $p < .01$ ) and having no knowledge about period at first menstruation (OR: 1.70;  $p < .1$ ). Interestingly, knowing about contraception from family and other sources increased the odds of daughters having been pregnant in comparison to not knowing about contraception (OR: 3.36;  $p < .1$ ; OR: 8.06;  $p < .01$ , respectively), but knowing from school was not significant. The odds of teenage pregnancy were lower for girls who lived in a rural area (OR: 0.56;  $p < .1$ ) and had internet access (OR: 0.55;  $p < .1$ ). The most predictive variable for contraception use was mothers' educational attainment. Having a more educated mother increased the odds of contraception use. Particularly, the odds of using contraception increased significantly if the daughters had a mother who had attended tertiary school (OR: 34.82;  $p < .05$ ). Belonging to an ethnic minority decreased the odds of contraception use (OR: 0.36;  $p < .05$ ).

### Discussion

The goal of this study was to explore maternal sexual empowerment as a risk factor of early sexual initiation, teenage pregnancy, and lack of contraception use among female adolescents. It was found that a lack of mothers' sexual empowerment—measured as a women's ability to turn down sex and demand contraception use from her partner—increases the odds of early sexual initiation of 16-year-old women. Consistent with previous research examining the intergenerational patterns of teenage fertility (e.g., Kahn & Anderson, 1992), having a mother who had a teenage birth was also related with early sexual initiation and teenage pregnancy. This measure was used to account for mothers' early sexual empowerment, which is also understood as a woman's ability to make safe and informed decisions to prevent and modify risky sexual behaviors. Conversely, having a mother who lacked sexual empowerment or had a teenage birth did not increase the odds of contraception use during their first time having intercourse.

As expected, this study found that girls whose mothers were more educated were less likely to have sexual intercourse and more likely to use contraception. Having a mother who attended tertiary school was by far the most significant predictor of contraception use. These results are consistent with previous evidence that suggests that parental education inhibits the risk of early sexual initiation (e.g., Guo et al., 2012, pp. 196–204; Jordahl & Lohman, 2009; Santelli et al., 2000). Findings also showed that the source from which girls received information about contraception was a good predictor of their sexual activity. After controlling for school attendance, girls who knew about contraception from family and other sources, including peers and the internet, were more likely to engage in sexual activity than those who reported having learned from school.

Two major discussion issues emerge from this evidence. First, it raises the question of the role of mothers' negotiation skills in sexual relationships on their daughters' sexual behavior. Research has shown that women are more likely than men to be forced to have intercourse on the first occasion, and that coercion rates are much higher with younger individuals during the first time of intercourse (Dickson et al., 1998). Therefore, it is plausible that early sexual initiators are more likely to be forced or persuaded by their partners to initiate sexual activity if their mothers themselves cannot escape from sexual coercion, or if they are instructed that women should be submissive even during sexual encounters. Second, it unfolds the risks posed by the source from which female adolescents get information about contraception and the role of parents in this matter. In Ecuador, parents have shown interest in addressing sexuality with their children in order to discourage them from having sexual relations. Yet, they face several constraints. These include a lack of knowledge and feelings of shame and anxiety when talking about sex, and the perceived idea that children already know



everything and, therefore, may refuse to talk about the topic (Jerves et al., 2014).

Findings of this study can be of particular advantage for policy-makers in Ecuador. Although the nature of this research does not allow for a causal relationship to be established, findings suggest that maternal sexual empowerment may shape daughters' attitudes towards sexual abstinence and ability to prevent sexual coercion and unintended pregnancy. This issue is of great concern as it is connected to abortion, which is penalized by law in Ecuador. Rates of non-consensual sex and abortion are highest among the youngest girls (Finer & Philbin, 2013). In Ecuador, the average annual rate of abortion between 2004 and 2014 was 115 per 1,000 live births. 189 abortion-related deaths were reported in the same period (Ortiz-Prado et al., 2017). According to Ortiz-Prado et al. (2017), women may still be intentionally terminating their pregnancies despite the ban on abortion by medicating themselves with uncontrolled substances and without proper medical assistance and counseling. This situation is most likely exacerbated by the several unsuccessful programs implemented since 2007 in Ecuador that aimed to reduce teenage pregnancy and improve the quality of sex education rather than implementing policies expanding opportunities for women and girls to safely receive abortions (Herrán & Palacios, 2020).

In addition to more targeted policies to ensure the sexual wellness of female adolescents in Ecuador, parental participation in pregnancy prevention programs is crucial. In this respect, this study also proposes a potential course of action. Parent-based interventions designed to delay sexual onset and promote contraception use typically focus on improving parent-child communication about sexual health and parental monitoring (Santa Maria et al., 2015). Yet, the results of this study indicate that interventions aimed at strengthening mothers' agency and autonomy in sexual relationships can potentially be useful at delaying their daughters' first time having intercourse. Further research, including impact evaluations, is needed to assess the extent to which and how mothers' skills at managing sexual relationships are associated with and influence daughters' sexual outcomes.

Another important contribution of this study is that it further urges the inclusion of a curriculum that challenges traditional gender norms and scripts in current sex education programs in Ecuador. Interventions aimed at changing gender norms, including attitudes towards justification of wife beating and a woman's ability to turn down sex, have been found useful at increasing women's empowerment and reducing gender violence (Gupta et al., 2013). As for today, however, there is still a public debate in Ecuador and other South American countries regarding whether the sex education curriculum should touch this topic as some parents feel their entitlement to decide how their children are educated is threatened. Thus, this curriculum should ideally incorporate parents' participation into school-based sex education while addressing their concerns towards models of sex education that discuss sensitive topics about gender norms and stereotypes.

### Limitations

While the socioeconomic and demographic characteristics of the mothers and adolescent daughters in our study are representative of Ecuador, the relationships we uncovered could be different for other settings within Latin America and globally as Ecuador has a particular high teen pregnancy rate in comparison to neighboring countries. Further studies are needed to understand the influence of maternal sexual empowerment on daughters' sexual behavior not only in Ecuador, but also in other developing countries.

As in most studies that use secondary data, not all variables necessary to understand the sexual activity of young females were available in the survey. As the survey was mainly concerned with health and nutrition-related information, questions relevant to other dimensions of sexual empowerment like attitudes towards domestic violence were not added in the model. Nevertheless, direct measures of mothers' ability to turn down sex and demand contraception use, and proxy measures of early

sexual empowerment such as having a teenage birth were included.

This study did not explore the relationship between maternal sexual empowerment and adolescent sons' sexual behavior. Although this was intended to be part of the study, the way male household members were sampled did not allow for a sample large enough to capture statistically significant relationships. While all female household members between 12 and 49 years old were sampled to answer the questions regarding sexual health, only one random male household member was sampled for the same purpose (either the father, a son, or another male subject). We encourage researchers to replicate this study to explore the connections between mother's autonomy in sexual relationships and young males' sexual and reproductive outcomes.

Potential sources of bias include social desirability bias and recall bias. In order to mitigate the effects of bias, we restricted the cutoff of early sexual initiation to 16 years as female adolescents have been found to be less likely to report sexual marriages and first births before age 15. There were some missing data (12.3% of eligible subjects). We ran a sensitivity analysis and found that non-response among daughters and mothers was not related to ethnicity, geographic area, income, and mothers' educational attainment. Thus, we do not think this poses a risk of selection bias or threatens the internal validity of the study.

### Ethical statement for SSM-Population health

- 1) This material is the authors' own original work, which has not been previously published elsewhere.
- 2) The paper is not currently being considered for publication elsewhere.
- 3) The paper reflects the authors' own research and analysis in a truthful and complete manner.
- 4) The paper properly credits the meaningful contributions of co-authors and co-researchers.
- 5) The results are appropriately placed in the context of prior and existing research.
- 6) All sources used are properly disclosed (correct citation). Literally copying of text must be indicated as such by using quotation marks and giving proper reference.
- 7) All authors have been personally and actively involved in substantial work leading to the paper and will take public responsibility for its content.

### Credit author statement

**Alonso Quijano-Ruiz:** Conceptualization, Methodology, Formal Analysis, Data Curation, Writing - Original Draft, Writing - Review & Editing. **Marco Faytong-Haro:** Conceptualization, Methodology, Formal Analysis, Writing - Review & Editing.

### Declaration of competing interest

None.

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