Secondary Education and Contraceptive Use in Mexico

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Abstract

This study examines the relationship between educational attainment and the use of modern contraception among married and cohabiting women in Mexico. Using data from the 2009 National Survey of Demographic Dynamics (Spanish acronym ENADID) we fit logistic regression models to observe whether or not higher school attainment increases the probability of using contraception, controlling for rural residence, age, parity, access to health services and indigenous status. Special attention is paid to secondary school because this level of education provides basic practical training for the labor market as well as a better understanding of the human body and human reproduction. Our results find evidence to support the important role of secondary school attendance and completion in contraception usage.

Introduction

In Mexico, it is said that the best contraceptive method is secondary school. An important body of research highlights the role of education on the proximate determinants of reproduction: marriage, contraceptive use, and breastfeeding duration (Castro and Juarez, 1995, Zavala de Cosío, 2001, Tuirán et al., 2002, Cleland and Rodriguez, 1988, Mier y Terán and Partida, 2001, Jeffery and Basu, 1996). In general, education has been found to have a positive effect on contraceptive behaviors and a negative effect on fertility (LeVine et al., 1991, Castro and Juarez, 1995, Zavala de Cosío, 2001). In Mexico, secondary school has been compulsory since 1993. This level of education provides the required knowledge to enter high school as well as basic practical training for the labor market. In general, those who do not complete secondary school are in a more disadvantaged position compared to those who complete secondary school since most of the jobs in the formal sector require the completion of this level of education. Secondary school also provides a better understanding of the human body and human reproduction which could lead to a more effective use of contraception and an increased acceptability of modern contraceptive methods. Thus, it is reasonable to predict that women who have completed more formal education may use modern contraceptives at higher rates.

Literature Review

Fertility level varies across socioeconomic groups. The most disadvantaged population generally has more children despite the fact the desired number of children of women of different socioeconomic status tend to be similar (Musick et al., 2009, Castro and Juarez, 1995). Researchers use level of education as a proxy for socioeconomic status to analyze this fertility differential. In fact, education is the most analyzed factor used to explain fertility changes (Mier y Terán and Partida, 2001). Bongaarts (2003) finds that the stage of demographic transition also plays a role in this relationship. He finds that educational gradient in fertility exists at all stages of demographic transition and that the differences in fertility at later stages of the transition are mainly due to highly educated women's increased ability to decrease unintended pregnancies.

Education and fertility are so closely related because education plays a central role in the proximate determinants of fertility through delaying marriage and childbearing and increasing contraceptive use. Many studies support the thesis that education contributes to reduce fertility levels by postponing marriage and childbearing (Cleland, 2002, Jejeebhoy, 1995). This paper focuses on contraceptive use because it is an important and modifiable proximate determinant of fertility. Education has been hypothesized to provide the means to avoid unintended fertility more successfully by enhancing contraceptive efficacy (Cleland, 2002, Castro and Juarez, 1995). In the relationship between mass education and contraception use women's education has been found especially significant and more powerful than husband's education, (Axinn and Barber, 2001, Bongaarts, 2003).

Castro and Juarez (1995) find that in the Latin American context, better educated women have broader knowledge, higher SES and less fatalistic attitudes toward reproduction than less educated women. Broader knowledge implies that women have a better understanding of their bodies which lead to more frequent and more effective use of contraception. Also, more educated women tend to live in urban areas, have higher household incomes and better standards of living. Finally, better educated women are more likely to control not only the number of children they have but also when they have them.

In Mexico, contraception almost completely explains the decrease in fertility between 1976 and 1995 (Zavala de Cosío, 2001). Women's age at first union and age at first birth have been steady in the last two decades. Therefore, the decrease in fertility results from the increase in

contraceptive use which was encouraged and supported by the Family Planning Program introduced at the end of the 1970s (Miranda, 2006, Mier y Terán, 2011, Zavala de Cosío, 2001, Mier y Terán and Partida, 2001). Although changes in the mean age at first union have not explained the changes in fertility, the urban and high educated women who initially adopted later patterns of childbearing significantly delayed their first union and transformed their fertility behavior through the use of contraceptive methods (Zavala de Cosío, 2001, Mier y Terán and Partida, 2001). Contraceptives and secondary education are both increasingly available in Mexico, but their rate of penetration has advanced slowly over the past decade. The relationship between education and contraceptive use in Mexico may be changing as selection into higher levels of educational attainment changes, as accessibility of contraceptives increases, or as society changes. Thus, the present study closely examines educational attainment and contraceptive use in the recent Mexican context.

Data and Methods

The data for this study come from the 2009 National Survey of Demographic Dynamics (Spanish acronym ENADID). This is a nationally representative demographic survey which provides information about fertility and contraceptive practices, health, and migration. The survey included a population representative sample of 101,000 households, including households from each of the 31 states and the Federal District. The survey includes a questionnaire for women which asks about the fertility history of each woman between 15 and 54 years old in each household. The women's sample includes 100,515 women aged 15 to 54 living in 70,336 households across the country. In order to control for risk of pregnancy, we include only married or cohabiting women between 15 and 49 years old, yielding a sample of 52,174 women.

We fit a series of logistic regression models to determine whether or not women with completed secondary education have higher contraceptive prevalence than women without secondary education. The dependent variable in these models is use of modern contraceptive methods and the control variables are education level, rural residency, speaking indigenous language, access to health services, age and parity.

We scored education as a series of categories, less than primary (5 or less years of schooling), primary or some secondary[1] (6 to 8 years of schooling), completed secondary (9 years of schooling), some high school or high school[2] (10 to 12 years of schooling), and more than high school (more than 12 years of schooling). Rural residency is used because fertility is usually higher in rural areas (Mier y Terán and Partida, 2001, Gómez de León, 1996); whether or not the woman speaks an indigenous language is used as a proxy of belonging to an indigenous group and it is included because the indigenous population tends to have limited access to education (Miranda, 2006). We also tested additional hypotheses about the differences in the coefficients for different levels of education.

Results

Table 1 shows the mean values of the variables used in the present study for contraceptive users and non-users. On average, users are older, have more years of schooling, have more children, and a higher proportion of them have access to health services and live in urban areas than non-users. A larger proportion of non-users speak an indigenous language.

<<TABLE 1>>

Table 2 shows the distribution of married and cohabiting women in the sample by reason for contraceptive use, parity and completion of secondary school. As it was expected, the percentage of non-users is generally higher for parity zero in all groups. More than half of the women in our sample without children are not using contraception. Among women using contraceptives at higher parity, stopping childbearing dominates as the reason for contraceptive use. For instance, 61.4% of the women with 2 children and more than 75% of women with more than 2 children, in our sample, use contraception to stop childbearing. Among women using contraceptives at parity zero or one, contraceptive use tends to be for spacing births. Around 34% of married and cohabiting women without children and 45% of women with only one child use contraception to space births.

For all parities, the percent of non-users who completed secondary school (54.9%) is lower than the percent of non-users who did not complete secondary school (80.8%). A higher proportion of

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[1] We tested if the effects of some secondary education versus the effect of primary education were different and because no significant difference was found, we collapsed these categories.
[2] We also tested if the effects of some high school versus the effect of high school were different. Again, no significant difference was found and we collapsed these categories.

women with secondary education use contraception to stop childbearing compared to their counterparts who did not complete secondary school. For example, at parity two, 66.2% of women with secondary education use contraception to stop childbearing while only 48.7% of the women with less than secondary education use contraception for the same reason.

<<TABLE 2>>

Table 3 shows the coefficients of the series of the fitted models for current use of contraception. In all models, education increases the probability of using contraception. Model one illustrates that higher levels of educational attainment are associated with higher levels of contraceptive use. An F-test of the equivalence of coefficients demonstrates that completed secondary school is associated with significantly higher rates of contraceptive use than lower levels of attainment ($p<0.01$). This relationship holds in Model 2, where rural residence is demonstrated to be associated with lower rates of contraceptive use. The increased contraceptive use among women with completed secondary education or higher remains statistically significant net of age and a quadratic age term in Model 3 and net of parity in Model 4. Model 3 demonstrates that the relationship between age and contraceptive use follows an inverted parabolic shape. Model 4 demonstrates that higher parity is associated with greater levels of contraceptive use. In Model 5, controls for access to health services and indigenous language are both associated with decreased contraceptive use and do not remove the statistical significance of the increase in contraceptive use associated with completed secondary school or higher attainment.

<<TABLE 3 >>

Figure 1 plots the predicted probabilities of the full logistic regression model (Model 5 in Table 3). At all parities women with less than a primary education are significantly less likely to use contraception than women with any higher level of education. For instance, at parity zero, the predicted probability for contraception use for women with completed secondary is 1.6 times higher than the predicted probability of women with less than primary. Also, at all parities the probability of using a modern contraceptive method is higher for those women who complete secondary than for those who did not complete secondary school. The greatest difference occurs to parities one and two.

<<FIGURE 1>>

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Figure 1 also illustrates that higher attainment yields higher contraceptive use at all parities. Although the predicted probabilities for women with more than high school are the highest at all parities, the difference between the predicted probabilities for women with more than high school and for women with some high school or high school education narrows as the parity increases.

Discussion

Previous research has demonstrated that education plays an important role in fertility decline by delaying marriage and childbearing as well as by increasing the use of contraceptives among women of higher parities. And in Mexico use of modern contraceptive methods was the dominant factor in the decline of fertility. Although the government has actively promoted the use of contraception across the population, this study has demonstrated that contraception use is still positively correlated with education. Among married and cohabiting women, we find that the probability of using a modern contraceptive method is significantly higher for those who have attained more than 12 years of education. We also find that secondary education is significantly associated with higher use of contraception.

These results highlight the importance of expanding secondary education which is not currently universal, even though it has been compulsory since 1993. Although the proportion of women with completed secondary education has increased over time, the expansion of this level of education has been slow. Today, around 40% of married and cohabiting women between 15 and 49 years old have not completed secondary education.

Our models also show that disadvantaged women, those living in rural areas and those speaking an indigenous language are less likely to use contraceptive methods. Rural residency and indigenous status are also negatively associated with educational attainment but this relationship is beyond the scope of the present study. Future research may seek to untangle the complex endogeniety characterizing these disadvantaged womens' experiences.

These results are limited to married and cohabiting women thus an important group of women is not considered in the present work. Since women in the youngest age groups are less likely to be married or cohabiting and the younger cohorts are experiencing higher education coupled with

earlier sexual activity, future work must examine the role that education plays in these womens' contraceptive practices.

The probability of using contraception increases as parity increases. Women may use contraception to space or limit their births and which of these motivations drives contraceptive use likely varies across parities and education levels. Therefore, future research might analyze the competing risk of using contraception for spacing births or using contraception for limiting childbearing.

Our results show a strong association between use of contraception and educational attainment. Educated women are more likely to use contraception and secondary education significantly increases the probability of using contraception. But, is secondary education the best contraceptive method in Mexico? Although the present study finds strong correlation between secondary education and the use of contraception, it also supports that attaining more than a high school education increases the likelihood of use contraception in general. If the direction of this relationship holds, by extension the best contraceptive method would be post-secondary education; however, in the current Mexican context where less than 50% of the married and cohabiting women between 18 and 49 years old have completed high school or where only 46% of rural women and 35% of indigenous women complete secondary education, having completed secondary education is an acceptable substitute. Thus, we can conclude that secondary education might be the best contraceptive method for socioeconomically disadvantaged women.

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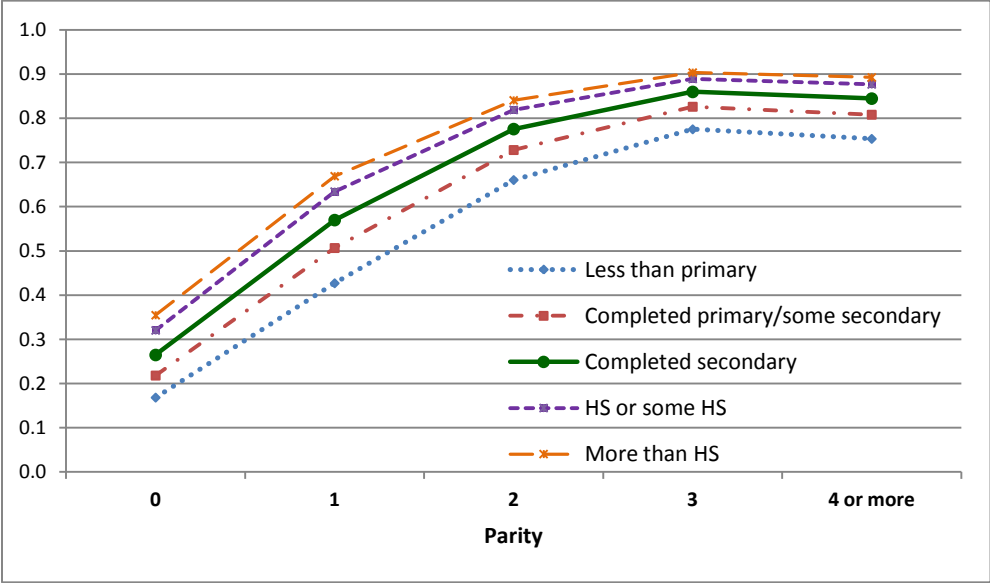
Table 1. Means of selected variables by contraceptive use for married and cohabiting women between 15 and 49 years old.

Variable	Non-users	S.D.	Users	S.D.
Years of education	8.47	4.28	9.14	4.15
Proportion with completed secondary	0.57	0.50	0.64	0.48
Age	32.00	9.30	35.12	8.26
Proportion in rural residency	0.30	0.46	0.20	0.40
Parity	1.80	1.35	2.51	1.09
Proportion with access to health services	0.60	0.49	0.68	0.47
Proportion who speak indigenous language	0.10	0.30	0.05	0.22
N	14,290		37,884	

Table 2. Contraceptive use status by parity and completion of secondary for married and cohabiting women between 15 and 49 years old.

	None	One	Two	Three	Four +
Less than secondary					
Not using	80.8%	45.2%	27.3%	19.1%	24.7%
Space	17.5%	39.0%	24.1%	11.3%	5.9%
Limit	1.8%	15.8%	48.7%	69.6%	69.4%
Completed secondary or more					
Not using	54.9%	31.7%	16.3%	10.0%	12.3%
Space	38.8%	46.4%	17.6%	8.3%	6.2%
Limit	6.3%	21.9%	66.2%	81.7%	81.4%
Total					
Not using	60.5%	34.7%	19.3%	13.6%	20.9%
Space	34.2%	44.7%	19.3%	9.5%	6.0%
Limit	5.3%	20.5%	61.4%	76.9%	73.0%

**Figure 1. Predicted probabilities for contraception use
(Married and cohabiting women between 15 and 49 years old)**

Table 3. Logistic regression models for current use of contraception

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Education					
Less than primary school (Reference)					
Completed primary/some secondary	0.246**	0.178**	0.323**	0.388**	0.321**
	(0.050)	(0.049)	(0.051)	(0.053)	(0.054)
Completed secondary	0.364**	0.251**	0.487**	0.673**	0.575**
	(0.050)	(0.049)	(0.051)	(0.053)	(0.053)
High school or some HS	0.488**	0.317**	0.522**	0.961**	0.844**
	(0.056)	(0.055)	(0.057)	(0.062)	(0.063)
More than High school	0.498**	0.311**	0.361**	1.128**	0.998**
	(0.062)	(0.061)	(0.062)	(0.072)	(0.072)
Rural		-0.462**	-0.386**	-0.479**	-0.442**
		(0.042)	(0.042)	(0.045)	(0.045)
Age			0.237**	0.047**	0.045**
			(0.014)	(0.015)	(0.015)
Age squared			-0.003**	-0.001**	-0.001**
			(0.000)	(0.000)	(0.000)
Parity					
None (Reference)					
One				1.307**	1.302**
				(0.065)	(0.065)
Two				2.264**	2.262**
				(0.071)	(0.072)
Three				2.842**	2.835**
				(0.077)	(0.077)
Four or more				2.695**	2.714**
				(0.081)	(0.081)
Health service					0.179**
					(0.036)
Indigenous					-0.522**
					(0.084)
Intercept	0.645**	0.863**	-3.761**	-2.297**	-2.238**
	(0.043)	(0.044)	(0.227)	(0.247)	(0.247)

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

Note: Numbers in parentheses are standard errors