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Source: *Studies in Family Planning*, Vol. 16, No. 6 (Nov. - Dec., 1985), pp. 321-331

Published by: [Population Council](#)

Stable URL: <http://www.jstor.org/stable/1967054>

Accessed: 06-04-2015 17:26 UTC

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# Effects of Women's Education on Postpartum Practices and Fertility in Urban Nigeria

**Gbolahan A. Oni**

*This study examines the influence of women's education on postpartum practices and fertility in Ilorin, a Nigerian urban community. Using life-table survival analysis to estimate breastfeeding and abstinence durations and the Cox Proportional Hazards Model to estimate relative risk of weaning and terminating abstinence, women's education was found to have a strong negative relationship with breastfeeding and postpartum abstinence. The use of contraception was low in this community and marital fertility for educated women was higher than for illiterate women. Policy implications of the findings and recommendations are discussed.*

It is well known that population policies and planning, particularly in developing countries, can benefit from an improved understanding of fertility-related postpartum behavior. Such an understanding can be facilitated by examining how certain socioeconomic conditions affect such behavior. This report focuses on women's education in particular, to examine its effect on the fertility-related practices of breastfeeding and postpartum abstinence, with the goal of identifying those factors that can make current developing country population policies more effective and meaningful.

Scientists and policymakers are currently giving much attention to breastfeeding and postpartum abstinence, as well as to the related phenomenon of lactational amenorrhea. There are two main reasons for this interest.

First, breastfeeding has been known for some time to be the best form of nutrition for the young infant<sup>1</sup> because of the protection it provides against a number of infections, particularly gastroenteritis, which is a major cause of infant and child mortality in developing countries.<sup>2</sup> Higher morbidity and mortality risks, associated particularly with diarrheal diseases, prevail for those children in developing countries who are bottlefed compared to those who are breastfed.<sup>3</sup> This may be due to

improper use of infant formula in poor areas of the world where clean water is not always available and where uneducated and poor women may overdilute the preparation, thereby impairing the food value and, consequently, leading to malnutrition and slower physical development in the infant. Also, bottlefed infants often receive foods that are not infant formula. These include various milks, cornstarch, and other water solutions, many of which are nutritionally inadequate. Hence, while improper formula use might be the primary reason for high morbidity and mortality, the extent to which other factors contribute remains undetermined.

A second reason for the current interest in these fertility-related practices is that breastfeeding has been shown to influence fertility by lengthening the period of postpartum infecundability (or postpartum amenorrhea).<sup>4</sup> Also, breastfeeding affects fertility through its association with sexual abstinence. In many societies, notably tropical Africa, cultural norms prohibit sexual intercourse for nursing mothers.<sup>5</sup> It is believed in those cultures that intercourse during the nursing period could result in the semen contaminating the breastmilk, thereby endangering the health of the baby. Abstinence is often prolonged in those cultures even beyond breastfeeding duration.<sup>6</sup>

When the duration of postpartum amenorrhea either exceeds or is shorter than the postpartum abstinence period, the longer of the two durations is referred to as the postpartum nonsusceptible period. In societies where a low level of contraception is practiced, breastfeeding (together with abstinence and amenorrhea) plays a major role in determining the fertility level. The longer the duration of the postpartum nonsusceptible period, the

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longer the interbirth interval and the smaller may be the overall fertility level, all else being equal.

Breastfeeding and abstinence practices are now known to be on the decline in many developing countries, especially in the urban communities.<sup>7</sup> This decline is being associated with changes in socioeconomic conditions, especially women's education. It is the effects of such changes—particularly in women's education—on fertility, rather than on infant and child mortality, with which this report is concerned.

## Education and Fertility

The inverse relationship of education with fertility is one of the most clear-cut correlations found in family planning and related literature.<sup>8</sup> The theory of demographic transition has assigned causal significance to the role of education in the formation of attitudes toward small family size norms and the practice of contraception. Until recently, most of the historical and contemporary studies in this area have supported the existence of an inverse relationship between education and fertility. However, it has lately been suggested that this inverse relationship is not absolute but, instead, that the direction of association depends on levels of economic development in different societies and cultures. Where low levels of socioeconomic development prevail, fertility has been shown to increase with even small amounts of education.<sup>9</sup> Therefore, in studying the effect of education on fertility, efforts must be directed not only toward establishing the nature of the relationship, but also toward determining those components—or direct determinants—of fertility that are affected by changes in education, as well as the direction in which they are affected.

This approach calls for the development of a conceptual framework to study the complex interaction of socioeconomic and cultural changes with fertility. One such framework has recently emerged from the deliberations of a working group of the Panel on Fertility Determinants.<sup>10</sup> There are three basic components or channels through which the factors identified by this framework operate to affect fertility. These are (1) supply of children, (2) demand for children, and (3) fertility regulation and its costs.

The "supply" of children refers to the number of surviving children a couple would have if no deliberate attempts are made to regulate fertility. Supply, therefore, depends on "natural fertility," which in turn reflects biological, cultural, and socioeconomic circumstances. "Demand" for children refers to the family size and composition a couple desires, and is seen as being determined by the interplay between desire (regarding both quality and quantity) for children and constraints on the couple. Demand is also determined by child survival.

The interaction of demand and supply considerations presumably determines whether and how strongly

a couple wishes to have or avoid a birth. Whether or not they take any steps to avoid it also depends on how desirable or acceptable contraception and induced abortion are. It is this kind of influence that is referred to as "fertility regulation and its costs." There can be costs of access to family planning information and services, social costs, and costs due to the use and potential use of contraception—for example, health risks, both real and imagined.

In order for any socioeconomic, cultural, or environmental factor to have a bearing on fertility, it must modify one or more of the above three basic components—supply, demand, and fertility regulation and its costs. Education is one socioeconomic variable that can have an effect on all three,<sup>11</sup> and the extent to and manner in which the three components are affected will determine whether fertility increases or decreases. Through an increase in age at marriage and the probability of remaining unmarried at each age, education tends to decrease the supply of children. However, through improved chances of child survival and decline in postpartum practices, education may increase the supply of children. The overall effect of education on actual fertility will depend on the demand for children as well as the practice of fertility regulation.

The demand for an additional child depends directly on the desired family size and current family size. The current family size, on the other hand, depends on previous fertility and on infant and child mortality. Since education is generally negatively related to infant and child mortality,<sup>12</sup> it is expected that education, through the mortality variable, also reduces the demand for an additional birth. In this framework, it is assumed that most couples actually formulate desires about family size and that the number of children desired depends on preferences and perceptions as to their various costs and benefits. General financial and practical assistance in old age are among the most frequently cited reasons for wanting many children. However, parents who obtain a good education can earn a higher income through better employment opportunities. Higher income may also lead to a demand for higher "quality" children rather than a higher quantity of them. The need for economic support from children is then lowered, thereby lowering the desire for many children. Education is also likely to enlighten parents as to various childrearing costs.

Given an expected supply of children and some concept of demand, how does a couple go about making a fertility decision? A couple's response to their supply-demand situation depends on several factors. These include social and cultural norms that directly affect attitudes toward fertility regulation. Fertility-related decisions also depend on knowledge of contraceptive methods and their costs, access to fertility regulation services, and good communication between spouses about family size goals. With increased education, couples tend to develop a "deviant" behavior toward certain

traditional forms of social control and the authority structure of the local community. Such behavior might be due in part to their exposure, via the school system and mass media, to Western images concerning the family. Through improved health and nutrition, as well as declines in breastfeeding and abstinence practices, the natural fertility rate is expected to increase with education; however, since education enables couples to perceive the various costs and benefits of children more accurately, as potential fertility begins to exceed demand, a deliberate motivation to regulate fertility develops. The relatively high cost of fertility regulation makes it difficult for poor couples to practice, but since it is expected that good education provides a better income, it should be much easier for those who are educated to purchase contraceptives.

## The Data

The data analyzed in this study are from a household survey that was carried out between September 1983 and January 1984 in Ilorin, the capital city of Kwara State, Nigeria. A total of 913 currently married women who were still of active child-bearing age (15–35 years) were interviewed, and information was obtained on the two most recent births of each woman. In order to have an adequate number of women at each educational level represented in our sample, the wards (i.e., administrative divisions) in the city were stratified into three groups according to whether they were high, medium, or low socioeconomic areas. One ward was selected from each stratum (based on the continuing research interest of the university in this area) and random samples of households were taken from each of the selected wards. A total of 932 households were included in the sample.

Information was obtained during the interview concerning the postpartum practices of the women following their two most recent live births. Also obtained was information on the socioeconomic characteristics of the women. The child was used as the unit of analysis in this study. However, the analysis was limited to the two most recent children born within 42 months before the survey, since breastfeeding and abstinence practices do not generally last for more than 42 months in this society. Apart from analytic advantages, this 42-month limit enabled us to capture recent fertility behavior and also to minimize the errors usually associated with long recall.

It is possible that some women might have had more than two live births within the 42 months chosen; however, given the cultural setting of this community—where breastfeeding and abstinence practices are nearly universal and generally prolonged, and the interbirth interval is usually long—the proportion of women giving birth to three or more children within a 42-month period will be very small. Hence, estimates based on the last

two births of each woman are not likely to be biased to any significant extent.

Use of the child as the unit of analysis in estimating durations of postpartum variables implies that these estimates will be smaller than if the woman is the unit of analysis.<sup>13</sup> This is because women with short birth intervals will contribute more children during a given length of time than women with longer birth intervals, and durations of breastfeeding and abstinence are usually positively correlated with length of birth intervals. However, since the focus in this study is not limited to the socioeconomic determinants of postpartum behavior, but also examines how changes in such behavior affect birth spacing and fertility, the child is more relevant than the woman as a unit of analysis.

The data are limited to currently married women who were 15–35 years of age, for a number of reasons. First, only about 5 percent of all births in the city are to women older than 35 years,<sup>14</sup> so it is simply not cost- or time-efficient to include women older than 35 years in the study. Moreover, information on postpartum practices reported by most of the women over 35 would not be recent. Second, older women might be practicing terminal abstinence rather than postpartum abstinence. Terminal abstinence is usually practiced in order to terminate childbearing rather than to space children, and it is often associated with “grandmaternal” status. A general feeling exists among these people that a woman should stop childbearing as soon as one of her older children starts childbearing. Finally, postpartum amenorrhea may lead to definitive amenorrhea among older women close to menopause.

In view of the nature of the study and the sensitivity of some of the questions that were asked, the interviewers were women aged 18 years and older who had at least a secondary school level education. They were either natives of Ilorin or had resided in Ilorin for at least five years, and understood both the culture and the tradition of the people and were able to speak the local language.

## Analyses and Results

Table 1 shows the distribution of the “rank” or children’s relative birth order by their mother’s education. As mentioned earlier, only the youngest and second-to-youngest child is considered. As shown in the table, the distribution of the child’s rank is nearly identical between the different educational levels of the mothers, with about 70 percent being most recent births and about 30 percent being second most recent births.

The estimations of the durations of breastfeeding and abstinence practices were carried out by using the life-table survival analysis approach.<sup>15</sup> This approach enabled us to properly treat incomplete postpartum information (that is, censored observations).

**Table 1** Relative birth order by mother's education, for all children born 0–42 months prior to the study period

Relative birth order	Number of cases by mother's level of education				Total
	None	Primary	Secondary	Post-secondary	
Youngest child	346 (71.2)	232 (68.2)	131 (70.8)	102 (72.3)	811 (70.4)
Second youngest child	140 (28.8)	108 (31.8)	54 (29.2)	39 (27.7)	341 (29.6)
Total	486	340	185	141	1,152

**Note:** The figures in parentheses are percentages of the total number for each column.

**Table 2** Life-table estimates of breastfeeding and postpartum abstinence durations (months), by mother's educational level

Behavior and level of education	No. of children	Life-table values				
		Median duration	Mean duration	$\chi^2$	d.f.	p
Breastfeeding						
No education	486	20.5	21.4			
Primary	338	14.0	14.3			
Secondary	182	11.4	11.3			
Postsecondary	139	9.4	9.5	407.9 <sup>a</sup>	3	0.000
Abstinence						
No education	484	22.5	22.8			
Primary	335	16.4	16.2			
Secondary	182	12.5	12.8			
Postsecondary	136	7.6	9.2	308.3 <sup>a</sup>	3	0.000

**Note:** d.f. = degrees of freedom; p = level of significance.

<sup>a</sup>The comparison of survival distributions among the education groups was carried out by use of Lee and Desu algorithms. See note 16 in the Reference section at the end of this report.

Table 2 shows the mean and median durations (in months) of breastfeeding and abstinence, for the different educational levels of the mothers in our sample. A comparison of the survival distributions for the four educational levels was carried out by using Lee and Desu algorithms.<sup>16</sup> The durations of both breastfeeding and abstinence decline as the educational level of the mother increases.

In the case of breastfeeding, the mean duration declines from 21.4 months among the illiterate group to 9.5 months among those with postsecondary education (a decline of about 56 percent). The comparison of the survival distributions of breastfeeding between the education groups gave significant results ( $\chi^2 = 407.86$  with 3 degrees of freedom;  $p = 0.000$ ).

Figure 1 shows the cumulative survival distribution of breastfeeding for the four educational levels of mothers. The graphs show a consistent decreasing survival distribution as one moves from the no education category

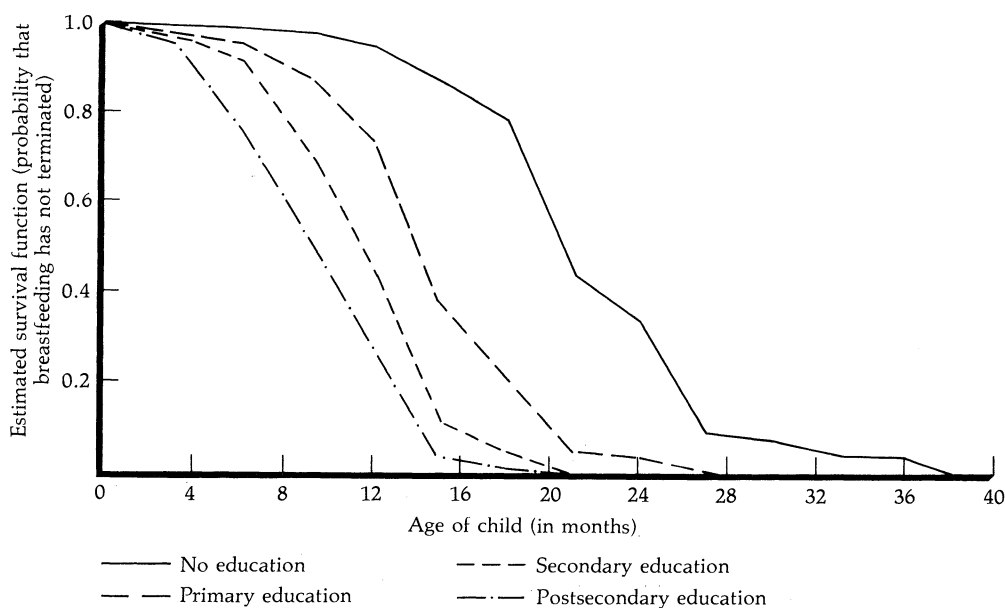
to the postsecondary education category. Furthermore, the difference in breastfeeding practice between the illiterate (no education) group and the group with primary education represents the sharpest difference between one level of education and the immediate next.

A similar trend was noted for abstinence, with its mean duration ranging from 22.8 months among the illiterate group to 9.2 months among the group with a postsecondary education. The comparison of the survival distributions, shown in Figure 2, also gave significant results ( $\chi^2 = 308.25$ , with 3 degrees of freedom;  $p = 0.000$ ). A pattern similar to that of breastfeeding duration was observed; however, the difference between the illiterate group and the group with primary education does not appear to be as pronounced as that observed for breastfeeding. In both cases, however, there is a sharp decline in the survival function after three months for those at the secondary and postsecondary educational levels, but again, the decline is sharper for breastfeeding than it is for abstinence.

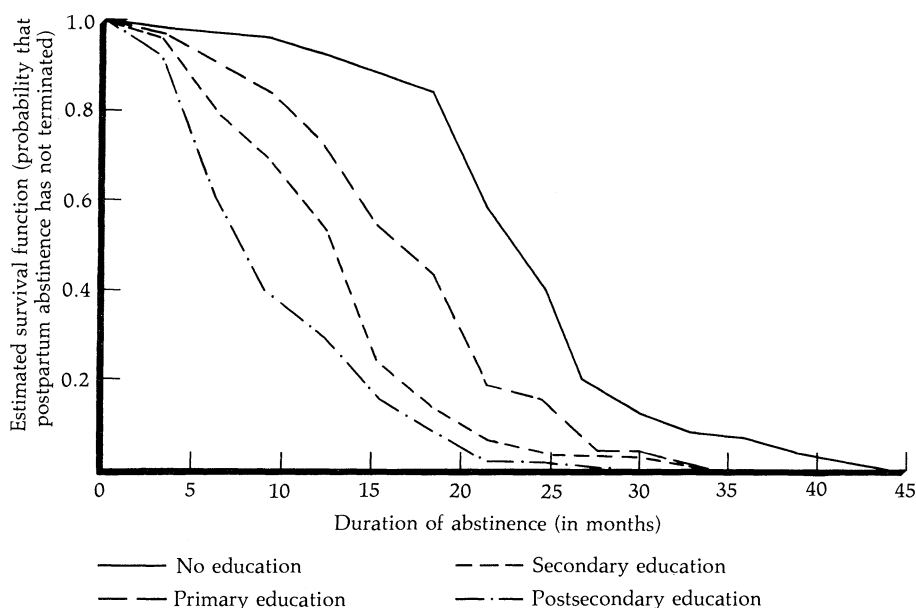
Mother's education may reflect a number of other dimensions such as age of a woman, her occupation, religion, type of marriage, use of contraception, and so forth. It is therefore possible that the differences in the postpartum practices between the different educational levels, represented in Table 2, mirror to some extent the differentials related to these other variables. This possibility requires a re-examination of the effects of mothers' education, by adjusting for these other dimensions. This was done in the present study by using the Cox Proportional Hazards Model,<sup>17</sup> a multivariate technique suitable for the analysis of survival data with or without censoring. The effect of a socioeconomic variable, or predictor, on the survival variable (i.e., the dependent variable, such as breastfeeding) after adjusting for several other covariates, can be assessed by calculating "relative risks," that is, the relative risk (or likelihood) of terminating either breastfeeding or abstinence. The results using the proportional hazards analysis are shown in Table 3 for both breastfeeding and abstinence. Here, ten additional covariates are considered along with mother's education. These are marriage duration, mother's age, her area of residence, the type of marriage, religion, ethnic group, her occupation, use of contraception, the sex of the child, and birth order of the child. For each variable in Table 3, that category with a relative risk of 1.00 represents the reference category, that is, the category to which all other categories of the variable are compared. A relative risk is significant at the 5 percent level, if its 95 percent confidence limits do not contain the value of 1.00.

In the case of breastfeeding—in addition to mother's education—area of residence, ethnic group, and contraceptive use following a birth were found to have significant independent effects on breastfeeding. Compared to children born to illiterate mothers, the risk of termination of breastfeeding at any time following birth, for those children born to mothers with primary, secondary,

**Figure 1** Survival distribution of breastfeeding, for four educational categories of mothers



**Figure 2** Survival distribution of postpartum abstinence for four educational categories of mothers



and postsecondary education, is, respectively, 1.94, 3.51, and 4.40. These findings confirm an actual decline in breastfeeding duration as the educational level of the mother increases. Also, children born to mothers who live in medium or high socioeconomic areas have almost

twice the risk of being weaned anytime following their births as those born to mothers who live in low socioeconomic areas.

Children born to non-Yoruba mothers also experienced a higher risk of being weaned at any one time,

**Table 3** Estimated relative risk of weaning children and of terminating abstinence, for children born within 42 months prior to survey, by sociodemographic characteristic

Sociodemographic characteristic	Weaning		Terminating abstinence	
	Relative risk	95% confidence limits	Relative risk	95% confidence limits
Mother's education				
None	1.00	—	1.00	—
Primary	1.94*	1.47, 2.55	1.67*	1.26, 2.22
Secondary	3.51*	2.49, 4.96	2.42*	1.70, 3.44
Postsecondary	4.40*	2.94, 6.59	3.27*	2.19, 4.88
Marriage duration				
<5 years	1.00	—	1.00	—
5–9 years	0.80	0.64, 1.01	0.63*	0.50, 0.80
10–14 years	0.82	0.59, 1.14	0.51*	0.37, 0.71
15+ years	0.93	0.52, 1.67	0.47*	0.26, 0.84
Maternal age at birth				
<20 years	1.00	—	1.00	—
20–24 years	1.33	0.98, 1.78	1.19	0.89, 1.60
25–29 years	1.09	0.77, 1.55	1.30	0.93, 1.82
30–34 years	1.14	0.73, 1.79	1.45	0.96, 2.20
Area of residence				
Low socioeconomic	1.00	—	1.00	—
Medium socioeconomic	1.70*	1.25, 2.31	1.25	0.96, 1.72
High socioeconomic	1.70*	1.26, 2.26	1.19	0.89, 1.60
Type of union				
Polygamous	1.00	—	1.00	—
Monogamous	1.03	0.80, 1.31	0.79	0.62, 1.02
Religion				
Muslim	1.00	—	1.00	—
Christian	1.13	0.89, 1.43	1.26	0.99, 1.61
Ethnic group				
Yoruba	1.00	—	1.00	—
Non-Yoruba	1.62*	1.23, 2.13	1.23	0.93, 1.64
Mother's occupation following birth				
None	1.12	0.85, 1.47	1.26	0.96, 1.64
Traditional sector <sup>a</sup>	1.00	—	1.00	—
Modern sector <sup>b</sup>	1.28	1.00, 1.53	1.07	0.83, 1.38
Contraceptive use following birth				
Not used	1.00	—	1.00	—
Used	1.84*	1.44, 2.37	2.94*	2.27, 3.80
Sex of child				
Female	1.00	—	1.00	—
Male	0.89	0.75, 1.04	0.89	0.76, 1.05
Birth order of child				
First birth	1.14	0.91, 1.43	1.15	0.92, 1.44
Second birth or higher	1.00	—	1.00	—

\*Significant at the .05 level.

<sup>a</sup>Traditional sector jobs include weaving, pot-making, embroidery, mat-making, and family farming.

<sup>b</sup>Modern sector jobs include teaching and other professional occupations, civil service, sales and service sectors, and clerical work.

relative to those born to Yoruba mothers; the relative risk for non-Yoruba mothers is 1.62. Finally, the use of contraception by the mother following the birth of the child has a significant effect on weaning. Children of mothers who used contraception have about 1.84 times the risk of weaning at any time compared to those whose mothers did not use any contraception.

The following variables have significant independent effects on the practice of postpartum sexual abstinence: mother's education, marriage duration, and use

of contraception following a child's birth. Relative to children born to illiterate mothers, the risk of terminating abstinence is 1.67, 2.42, and 3.27 for those children born to mothers with primary, secondary, and postsecondary education, respectively. Unlike breastfeeding, termination of abstinence appears to be strongly affected by marriage duration. The longer the duration of marriage, the less likely that abstinence will be terminated early. Two possible explanations quickly come to mind. The first is that perhaps mothers who had been married for

more than ten years, for example, had reached or were very close to their desired number of children, and prolonged abstinence might be a means of spacing their last few births. The second possible explanation has to do with the sexuality (or sexual urge) of a woman or couple. Sexual urge might diminish with length of marriage. Young couples who have been married for not more than five years, for example, may be more sexually active than those couples who have been married for several more years and have probably produced many children.

Finally, as with breastfeeding, contraceptive use has an important effect on the termination of postpartum abstinence. The risk of termination of abstinence following the births of those children whose mothers used contraception is 2.94 times the risk for those whose mothers did not. Contraceptive use seems to have a more powerful correlation with termination of abstinence than with weaning (the risk of weaning among contraceptive users being 1.84 times that of nonusers). The tendency to terminate abstinence is apparently greater, or happens sooner, than the tendency to terminate breastfeeding among users of contraception. Such a trend should be expected, since couples adopt contraception as a direct substitute for prolonged abstinence—that is, when abstinence is being practiced only to avoid conception.

#### The Fertility Impacts of the Postpartum Variables: Analysis of Proximate Determinants

As was mentioned earlier, in order for a socioeconomic, cultural, or environmental factor to affect fertility, it must do so through one or more direct determinants of fertility. The direct fertility determinants were referred to by Davis and Blake<sup>18</sup> as intermediate variables; Bongaarts later

called them “proximate determinants,” and identified seven such factors.<sup>19</sup> These are: marriage pattern, use of contraception, induced abortion, postpartum infecundability, frequency of intercourse, spontaneous abortion, and sterility. However, it has been shown that only the first four of these seven factors are responsible for the differences in the fertility levels or trends among or within populations.

To quantify the relationship between these four factors, Bongaarts developed a multiplicative model.<sup>20</sup> The central equation of this model is:

$$\text{TFR} = C_m \times C_c \times C_a \times C_i \times \text{TF}$$

where TFR is the total fertility rate,  $C_m$  is the index of marriage,  $C_c$  is the index of contraception,  $C_a$  is the index of induced abortion,  $C_i$  is the index of postpartum infecundability, and TF is the total fecundity rate. (The typical value of TF is 15.3, with little variation from population to population.)

Each of the above indices can take on values between zero and one. For example,  $C_i$  equals one in the absence of lactation and postpartum abstinence and zero if the duration of postpartum infecundability is infinite. Given a TF value for a population, if only the fertility-reducing effect of postpartum nonsusceptibility is included, the TF would be reduced to the total natural marital fertility rate (TN). If the effect of contraception and induced abortion is added, TN would be further reduced to total marital fertility rate (TM), and, finally, if the effect due to celibacy is accounted for, TM would drop to TFR.

All the above indices were estimated in the present data for the different educational levels of the study respondents, and the results are shown in Table 4. Notice

**Table 4** Estimates of proximate fertility determinants indices and of fertility rates, by mother's educational level

Estimate	Level of education			
	None	Primary	Secondary	Postsecondary
Indices of proximate determinants				
$C_{am}$ = lactational amenorrhea	0.602	0.733	0.795	0.831
$C_{ab}$ = postpartum abstinence	0.805	0.786	0.804	0.869
$C_i$ (= $C_{am} \times C_{ab}$ ) = postpartum nonsusceptibility	0.485	0.576	0.639	0.722
$C_a$ = abortion <sup>a</sup>	1.000	1.000	1.000	1.000
$C_c$ = contraception	0.993	0.961	0.907	0.804
$C_m$ = marriage <sup>b</sup>	0.880	0.810	0.710	0.640
Fertility rates (per woman)				
Total natural marital fertility rate = TN = $C_i \times \text{TF}^c$	7.400	8.800	9.800	11.000
Total marital fertility rate = TM = $C_a \times C_c \times \text{TN}$	7.300	8.500	8.900	8.800
Total fertility rate = TFR = $C_m \times \text{TM}$	6.400	6.900	6.300	5.600

<sup>a</sup>The effect of induced abortion on the fertility of the study population is assumed to be negligible.

<sup>b</sup>See appendix.

<sup>c</sup>A TF value of 15.3 was used. See note 19 in the Reference section at the end of this report.



**Table 5** Numbers of currently married women who have any knowledge of contraception, ever used contraception, used any method since most recent birth, or are currently using contraception, by women's level of education

Educational level	Knowledge		Ever user		User after last birth		Current user	
	Yes	No	Yes	No	Yes	No	Yes	No
All groups N = 913	690 (75.6)	223 (24.4)	168 (18.4)	745 (81.6)	122 (13.4)	791 (86.6)	55 ( 6.0)	858 (94.0)
None N = 380	221 (58.2)	159 (41.8)	7 ( 1.8)	373 (98.2)	6 ( 1.6)	374 (98.4)	3 ( 0.8)	377 (99.2)
Primary N = 258	218 (84.5)	35 (15.5)	44 (17.1)	214 (82.9)	28 (10.9)	230 (89.1)	11 ( 4.3)	247 (95.7)
Secondary N = 158	141 (89.2)	17 (10.8)	50 (31.6)	108 (68.4)	37 (23.4)	121 (76.6)	16 (10.1)	142 (89.9)
Postsecondary N = 117	110 (94.0)	7 ( 6.0)	67 (57.3)	50 (42.7)	51 (43.6)	66 (56.4)	25 (21.4)	92 (78.6)

**Note:** The percentages for each educational level are shown in parentheses. Sample includes all currently married women aged 15–35 years, regardless of parity.

that the postpartum nonsusceptibility index,  $C_i$ , produced the greatest inhibiting effect on fertility, however, the magnitude of its reduction effect varies from 51.5 percent among those mothers with no education to only 27.8 percent among those with a postsecondary education. The use of contraception has been very low in the study population (see Table 5), and in spite of reduced breastfeeding and abstinence practices by the educated mothers, the decline in duration of nonsusceptibility was not fully compensated by contraceptive practice. A higher marital fertility rate resulted among educated women compared to those with no education, and it is only because of delayed marriage that women with a secondary or postsecondary education tend to have slightly lower overall fertility (measured by total fertility rate) than the illiterate women. However, those with a primary education have the highest total fertility rate (6.9 children per woman).

## Policy Implications

Population policy should be the responsibility of governments, and in designing policy measures to help officials cope with the problems arising from a society's particular fertility pattern, it is important to distinguish between those behavioral and biological factors that have a direct impact on fertility and those socioeconomic and cultural factors that affect fertility only indirectly through the proximate determinants. An understanding of the relationship between the direct and the indirect fertility determinants permits a clearer perception of specific opportunities for effective policy interventions. Women's education is one major socioeconomic variable that has a great impact on the intermediate variables and, hence, on fertility; it should therefore be considered seriously in fertility-related policies.

As this study has shown, breastfeeding and absti-

nence practices have declined as women's educational levels have increased and there is no reason to expect that this situation will change in the near future. The recent changes in these practices can be attributed to the availability of breastfeeding alternatives through artificial milk and baby food products. It might also be attributed to new perceptions of women's sexuality in marital relations. For the modern woman, sexual relations are no longer simply a means of procreation, but also an important element in a smooth and successful marriage.

Although there has been a significant decline in postpartum practices with an increase in education, the use of contraception has remained low, even among educated women, resulting in a high total fertility rate and, in the case of those with primary education, an even higher fertility rate than that of illiterate women.

Although the percentage of women in the study population who had some knowledge of contraception is high (shown in Table 5), varying from 58.2 percent among illiterate women to 94.0 percent among women with a postsecondary education, the proportion of the women who had ever used or were currently using a contraceptive method is low in the population. The percentage of ever users ranges from 1.8 percent among those with no education to 57.3 percent for the postsecondary education category, and current users range from 0.8 percent to just 21.4 percent, respectively.

We wanted to know in Table 6 if the low level of contraceptive use in this population was due to any strong objection to family planning by the women, possibly based on either moral or religious grounds. The respondents were asked to indicate whether it is objectionable for a woman to adopt family planning in order to regulate her fertility. At each of the educational levels, more than 90 percent had no objection. Of the 65 women who objected, only 14 (or 21.5 percent) gave moral or religious reasons and 16 (24.6 percent) objected for health reasons. It is obvious from these results, therefore, that

**Table 6** Percentage of women objecting to or accepting the idea of family planning, by level of education

Educational level	Percentage		Don't know
	Object	Accept	
None (N = 380)	6.1	92.1	1.8
Primary (N = 258)	7.8	92.2	0.0
Secondary (N = 158)	7.6	92.4	0.0
Postsecondary (N = 117)	8.5	91.5	0.0

low contraceptive prevalence cannot be attributed to ignorance or to any strong objection based on religious or moral grounds.

Given the high level of awareness of family planning methods and lack of objection to their use, why then is the level of use so low in the study population? As mentioned earlier, it is the interaction of supply and demand considerations that determines whether and how strongly a couple wishes to have or avoid a birth. Demand for children is determined by the interplay between a couple's perception of them (in terms of desired quality and quantity) and the constraints on the couple. In this study population, the demand for children is still relatively high, even among the educated. When we asked the women how many children they would prefer to have in their lifetime, over half of the women (53.5 percent), and especially the uneducated women (81.1 percent), did not specify any number but instead indicated "as many as God wishes." For those who gave a figure, the average number of children desired varies from 4.9 among those with a postsecondary education to 6.6 among those with no education (Table 7). These figures suggest that the demand for children is still very high in the study population.

If the demand for children remains as high as we have observed (almost equal to the estimated total fertility rates), it would be difficult to implement any effective family planning program that would help to reduce fertility. Population policy must, therefore, also be directed toward reducing the demand for children. If couples accurately perceive the costs of having children (money, time, and other opportunity costs), their demand will be affected accordingly. The ability to weigh childrearing costs against the perceived benefits of an additional child should enable parents to make appropriate decisions about fertility regulation.

In Nigeria, the constraints on couples with regard to childbearing cannot be considered very high. The prevalence of the extended family system allows an educated working mother to rely on a close relative (usually her mother or mother-in-law) to look after her child while she goes to work. Also, housemaids or servants can be employed at a very low cost. Some couples, especially among the illiterate group, who have many children, may decide to invest their resources on one or two earlier

**Table 7** Mean number of children desired, by women's educational level

Educational level	Mean no. of children desired	Standard deviation
None (N = 72)	6.6	2.20
Primary (N = 142)	6.2	2.06
Secondary (N = 112)	5.3	1.15
Postsecondary (N = 98)	4.9	1.37

**Note:** Of the 913 women in the study population, 489 did not specify a desired number of children, indicating instead "as many as God wishes." The number of women in each group who specified is given in parentheses.

births by sending those children to school, while the younger children engage in a family occupation or low-level employment to supplement the family income. It is usually expected that the educated child will later be in a better position to support both parents as well as the younger brothers and sisters.

There are also a number of governmental policies that are unrelated to population and fertility, which, although unintentionally, may promote high fertility or lead to lack of motivation to regulate fertility. Such policies, together with prevailing social factors, may cause many couples, to perceive an additional child as being a net benefit rather than a net cost. Five of these policies demand some mention:

- 1 *Education policy* The free Universal Primary Education policy is helping to increase the proportion of women with a primary education in the population. While a primary education is sufficient by some standards, and is certainly an improvement over no education at all, it is not sufficient for teaching women to fully appreciate the importance of sex education and the value of contraception.
- 2 *Taxation system* In this system, the amount of tax relief an employee receives is positively related to the number of children that he or she has, so the costs of additional children are generally minimized.
- 3 *Housing policy* In several government (and even private) establishments, the number of children an employee has is one of the factors that are considered in housing allocation. An official with four or more children might be considered for a larger and better accommodation than another official of equal rank who has two children or less, even though the cost of the accommodations to both officials would be the same.
- 4 *Implementation of ILO recommendations* Since the 1919 convention of the International Labour Organisation (ILO), maternity protection has been a major ILO policy. Included among current policies is a recommendation that a working mother be given about three months of maternity leave and that, when she returns to work, should be allowed about an hour off her work schedule each day to enable her to nurse

her baby. In many developed countries, including the United States, the United Kingdom, and Canada, there are no provisions even for nursing breaks or nursing facilities. In Nigeria, however, women are given between three and four months of maternity leave without any loss of income during the period. They also take time off from work to nurse their babies. Hence, this policy helps to minimize both time and money costs of rearing children, making a large family less objectionable.

- 5 *Revenue allocation* The federal revenue allocation to states and local governments from the federal consolidated revenue is partly based on the population of each state and local government. Currently, 40 percent of the allocation is based on population. The issue of population control can, therefore, become a very sensitive political issue, with politicians at state and local government levels hesitant to propose or promote smaller families, since fewer people means less federal funding.

## Discussion and Recommendations

The data in this study show that women's education is strongly and negatively related to the practices of breastfeeding and postpartum abstinence in Ilorin. This finding is, perhaps, true for all the urban communities in Nigeria. Studies in Ibadan and Lagos, for example, have confirmed this negative association.<sup>21</sup> The study further demonstrates that the decline in these practices has led to increased marital fertility among educated women, because contraceptive use has been low and could not, therefore, compensate for the protection provided by longer durations of postpartum nonsusceptibility.

Low levels of contraceptive use were due neither to ignorance on the part of the women in our study regarding the availability of such methods, nor were they due to any strong objection to contraceptive use for religious, health, or moral reasons. However, due to a social structure incorporating the extended family system, and some governmental policies that tend to encourage high fertility by reducing the cost of rearing children, demand for an additional child is still high among all women in this study, including the educated ones. This could be the major reason for such a low level of contraception among the women in this community. Moreover, since the data focus on those women who are still of active childbearing age, it is likely that many of those women who used contraception did so primarily for the purpose of child spacing rather than for fertility limitation.

Several recommendations concerning fertility reduction in this region can be presented:

- Nigeria currently has no specific policy to deal with its growing population, even though the government recognizes the problem of rapid population growth. The government supports family planning programs; however, public support for family plan-

ning services is quite different from a population policy aimed at lowering fertility. The former has social goals that include more than fertility reduction, but it has more limited population goals than specific population policy. While family planning programs provide information and services to help people achieve their fertility objectives, population policy involves explicit demographic goals, which employ a wide range of interventions, direct and indirect, to change the motivation for having children. In order to deal effectively with its population problem, Nigeria should have a population policy.

- A need also exists for the expansion of educational opportunities, especially for girls, at least up to the secondary school level. The successful fulfillment of this need may require that education be made compulsory for all until the secondary school level. Such a requirement will not only help to increase the age at marriage for females and promote more accurate perceptions concerning their fertility, but will also enhance women's capacity for a more lucrative and useful life. Such compulsory education would necessitate a greater investment in education by the government, but such an investment makes more sense than an endless, nonqualitative expansion of maternal and child welfare services. Population (or sex) education should be introduced into the secondary school curriculum, as well.
- There is the need for vigorous prenatal education, which stresses the importance of longer periods of lactation, especially for the health of the baby.
- All government policies that directly or indirectly encourage large families must be re-evaluated with a view toward eliminating all implicit subsidies for large families.
- While governments may continue to conform with the ILO recommendation concerning maternity leave, they must do so with some modifications. Such leave should be without pay for most of the period, and each woman should be allowed to decide how long she wants to be on maternity leave, with the maximum leave being three months. Alternatively, paid maternity leave could be granted, say, only once every four or five years.
- Family planning facilities should be expanded and contraceptive devices made more available. Ilorin, with a population of about half a million people, had only two family planning clinics known to the general public at the time this study was conducted. Public awareness of the importance of family planning must be intensified through the mass media as well.
- Finally, if policies to reduce fertility are to be supported and promoted at the state and local government levels, far less importance should be placed on population size in an area when government funding decisions are made.

## Appendix

The index of marriage,  $C_m$ , is usually calculated from the proportion of women who are married among all women by age, as well as the schedule of age-specific marital fertility rates.<sup>22</sup> The calculation of  $C_m$  is as follows:

$$C_m = \frac{\sum [m(a) \times g(a)]}{\sum g(a)}$$

where  $m(a)$  = age-specific proportions of women currently married and  $g(a)$  = age-specific marital fertility rates.

Since we did not have data on single women by educational level in our study, we could not estimate  $C_m$  directly for the different educational categories of the respondents. However, Lesthaeghe et al.<sup>23</sup> have estimated  $C_m$  values for educational categories of Lagos women. In the present analysis, we assumed that both the age pattern of marital fertility,  $g(a)$ , and the pace of marriage (that is, the rate at which women are drawn into unions) are the same for women in Ilorin and Lagos, so that the structure of nuptiality function,  $m(a)$ , will be essentially the same in the two populations, differing only in the age at which marriage began.<sup>24</sup> By adjusting for the differences in the mean age at marriage in our study and those estimated for Lagos women, we were able to estimate the  $C_m$  values for Ilorin that are shown in Table 4.

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The expert advice and continuing support of Dr. James McCarthy, Associate Professor in the Department of Population Dynamics at The Johns Hopkins University, is gratefully acknowledged. This study was supported by funds provided by the University of Ilorin, The Population Council, The National Science Foundation, and The Hewlett Foundation. The views expressed in this paper do not necessarily represent those of the above organizations.

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