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ORIGINAL CONTRIBUTION

Association between Contraceptive Usage and Maternal Education towards Birth Spacing: Evidence from Pakistan Demographic Health Survey (PDHS) 2017–18

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Abstract— Contraception is a birth control method to prevent unwanted pregnancies. Many developing countries have maintained their birth rates in the last quarter despite various family planning options. Pakistan is also struggles to join this race by inculcating vibrant population growth measures. In this context, many social, cultural, and geographical trends have key roles to play in increasing contraceptive prevalence and acceptance trends in Pakistani society. Education has played an important role in the women's autonomy and effective communication with their husbands about the number of children and contraceptive use. The current study was tried to explore the factors associated (regions, place of residence, and wealth index) with contraceptive use and to find out the relationship between mothers' education and the adoptability of female birth control methods. The secondary data of 13558 ever-married female respondents aged 15–49 years from the Pakistan Demographic and Health Survey (PDHS) 2017–18 was taken for this study. The stratified sampling technique was used in the survey. Bivariate analysis was applied to investigate the relationship between mothers' level of education and contraceptive use. A Chi-square model was used to see the association with other factors. The study results revealed a positive relationship between maternal education and contraceptive use. Results have indicated that the increased education level of mothers is closely associated with contraceptive use. However, more than half of uneducated mothers (62.1%) did not use contraception. By analyzing the results, it is concluded that educated mothers play a vital role in decreasing fertility rates by using different fertility control methods, so education remains the key factor in increasing the prevalence of contraceptive methods. Along with other facilities regarding birth control, there is a dire need to increase the literacy rate. Considering the study results, it is a prerequisite to designing policies and education reforms to promote birth control through education.

Index Terms— Contraceptive use, Fertility, Education, Birth control, Birth spacing.

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Introduction

Many developing countries experienced a low birth rate in the last quarter after implementing various family planning strategies. Demographic changes have focused on the determinants of the preventive use of birth control to reduce fertility rates (Gee, Vargas, & Foster, 2019). Contraception is a birth control method to prevent unwanted pregnancies. Pakistan was estimated to be the most populous country in the world, with the lowest contraceptive use (Nyoni, 2018). It initiated many programs to control fertility rates and introduce

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contraceptive use, but the results were unsatisfactory due to social, political, and cultural constraints (Waisbord, 2018). Still, Pakistan is facing a serious problem to balance its resources according to population of country.

Although, contraceptive use has increased and the fertility rate has decreased a little bit, the current contraceptive use rate is 35% in Pakistan, while the total fertility rate is 3.8 per woman (Habib et al., 2018). At the same time, the contraceptive prevalence rate in developed countries is 80% (Cammock, Priest, Lovell, & Herbison, 2018). It indicates that contraception is insufficient to meet the demand for fertility services in developing countries. Even though increasing access to modern contraceptive use is one of the basic goals of sustainable development, along with Pakistan, India is a signatory to the Family Planning 2020 Pledge and has signed the commitment to increase the contraceptive prevalence rate from 35% to 55% and reduce the overall fertility rate from 3.8 to 2.6 per woman till 2020 (Ahmed, 2018). Furthermore, Pakistan has decided to cooperate with men and religious leaders to promote and accept birth control methods and also discuss family size with their life partners.

Before the 18th Amendment to the Constitution of Pakistan, services related to family planning were promoted by the ministries of health and population welfare with provincial departments (Naqvi, Ibrar, & Walsh, 2018). But now, both the public and private sectors provide family planning services. Provincial departments are fully authorized to make and implement family planning programs (Chishti, Chishti, & Jaglal, 2019). Service delivery centers are run by the public sector, which contain family welfare centers, reproductive health services centers, mobile service units, secondary and tertiary health care facilities, and lady health workers (Salah & Kidd, 2019).

The geographic region of the people also plays an influential role in the use and demand for contraceptives (Ataullahjan, 2018). Women's autonomy and communication with their husbands and parents indicate positive trends in contraceptive use for the benefit of both the child and the mother (Khalil & Mookerjee, 2019). The females' discussions with their partners about family size lead to different fertility trends (Keesara, Juma, Harper, & Newmann, 2018). Door-to-door counseling of women and their husbands produces awareness and knowledge about their modern contraceptive methods and works effectively to increase the acceptability of these methods in society (Gheorghe, Zaman, Scott, & Witter, 2018). The government of Pakistan has introduced a lady health worker program, which provides door-to-door counseling to the spouse and distributes contraceptive methods. Contraceptive use increased by 18% due to the lady health worker program's counseling (Sultan, 2018). Demographic change has brought about a big change in Pakistan's population trends. At an earlier time, most of the population was younger, with a proportion fewer than 15 years, due to a high fertility rate. This trend has changed in the last two decades, and now Pakistan is rich with a working-age population (Pigeyre, Saqlain, Turcotte, Raja, & Meyre, 2018). Our working-age population is 117 million, which is 62% of the total population (Mubarak, Azeemuddin, Anwar, Nizamani, & Beg, 2018). Now, if the economy can provide them with employment opportunities and create new jobs for them, Pakistan may make a unique kind of progress. Another change in Pakistan's demographic is that family size is decreasing daily (Belkebir, & Moumen, 2022; Haider et al., 2019). The preferences of parents have changed with the passage of time from large family members to small ones. And this is why Pakistan faces 4 million unwanted pregnancies, and half of them end in unwanted births (Rehman, 2018), and this is considered the major factor due to which the fertility rate is declining and the use of contraceptives is increasing (Kittichottipanich, 2016; Shah, Ali, Jehan, & Gul, 2019).

Family planning is now playing a critical role in the welfare of both the individual family and the nation as a whole. A variety of and service-related factors, including maternal educational status, contraceptive use, length of breastfeeding residence, sex of the index child, survival status of the index child, religion, and unintended pregnancy, were identified in Pakistan through various studies on childbirth spacing. Furthermore, there is no study at the country level evaluating the impact of maternal education on the adoption of contraceptive techniques for birth spacing. Even if they have conflicting results across the board, maternal educational status, contraception use, and length of nursing are commonly discussed and clinically significant factors promoting short birth spacing. In order to determine the pooled prevalence of short birth spacing and its correlation with mother education level, contraceptive use, and duration of breastfeeding among Pakistani women of reproductive age, this meta-analysis was conducted. This research will advance the body of knowledge in the scientific community. It will play a significant part in raising the level of education of the female population of the society in order to implement efficient family planning for the advancement of civilization.

Objectives of the study

- To find out the relationship between the maternal level education and the trends of contraceptive use
- To analyze the relationship between other social factors (Economics situation, Residence, and Region) toward contraceptive practices
- To access the prevalence rate of birth control methods

Literature Review

Concerns about the national family planning program's persistent ineffectiveness are raised by patterns un contraceptive use in Pakistan over the past 20 years. An alarming trend demonstrating the falling significance of hormonal methods and the IUD in rural regions

was discovered by a recent study that analysed changes in contraceptive use and the method mix in Pakistan using the 1990–1991 and 2006–2007 Demographic and Health Surveys (Carton, & Agha, 2012). Over this time, the proportion of traditional techniques in the rural method mix rose from 17% to 26%, whereas the proportion of hormonal methods and IUDs fell from 33% to 26%. The proportion of hormonal treatments and IUDs in the technique mix in urban areas remained consistent during this time but remained relatively low at 18%. (Carton, & Agha, 2012). The results of this study emphasise the significance of comprehending the variables that have lowered the significance of hormonal methods and the IUD in the method mix and boosted the preference for traditional procedures.

The social and psychological costs of contraception, as well as the environment around the availability of contraceptives, have been the focus of studies looking at the factors influencing the usage of contraceptives in Pakistan. Sirageldin reported on data from the Pakistan IMPACT survey, which was carried out in West Pakistan in 1968–1969 and indicated that while knowledge of a family method was widespread, knowledge of family planning professionals and facilities was low. 5.5% of people used contraception, with urban prevalence being more than twice as high as rural prevalence (9.8% vs. 3.9%). Just 5% of people visited places that offered family planning counselling, and those visits were strongly connected with using family planning. There was a significant latent desire for family planning, with 38% of urban and 31% of rural spouses reporting that the number of children they had at the time of the survey was equal to or greater than their ideal number and that they did not want any more. When the authors looked at future intentions to use family planning, they discovered that a woman's intentions increased by 31% if her husband supported family planning and that they increased if a family planning facility was less than 30 minutes away. Sirageldin came to the conclusion that although there was a latent want for family planning, cultural and societal barriers like a husband's permission prohibited this demand from being fulfilled. The study found that the programme delivery system was substantially deficient and that the supply of information and services was insufficient to stimulate latent demand into the use of family planning (Sirageldin, Norris, & Hardee, 1976). In addition to Sirageldin (Sirageldin, Norris, & Hardee, 1976), a number of research have looked at how social and cultural factors affect the usage of contraception in Pakistan. These studies (Pasha, Fikree, & Vermund, 2001) underlined the significance of communication between spouses regarding the use of contraception and the influence of the mother-in-law and the husband on family planning decision-making (Islam, Islam, & Banowary, 2009). It has also been discovered that fatalistic views, notably the notion that fertility is in God's hands, have a significant influence on the use of family planning. This concept still has a significant impact on how often people use contraception: in 2006–07, 28% of Pakistani women who did not plan to use contraception in the future stated that their fertility was determined by God's will. According to one study (Kaur, & Lehal, 2022), Punjabi women's intentions to use family planning in the near future were affected by a variety of social and psychological costs of family planning. Three major barriers to the use of family planning were found to have a significant impact on intentions to use family planning, according to the study. These barriers were: a woman's perception that using contraceptives would conflict with her husband's attitudes towards family planning or with his fertility preferences; her perception that using contraceptives was socially or culturally unacceptable; and her knowledge of contraception. The economic and demographic literature has extensively studied the impact of women's education on their preferences and reproductive behaviour (Senderowicz, & Maloney, 2022). The traditional microeconomic model of fertility, which views the labour market as a key conduit for reproductive behaviour, can theoretically be used to explain this effect (Tasciotti, Sulehria, & Wagner, 2022). Education raises the opportunity cost of leaving the workforce to have children by raising the wages of women in the labour market (Chen, & Guo, 2022). According to this substitution effect, women who make the best reproductive decisions have fewer children overall. Although a household with a high income may find it easier to care for multiple children, this economic benefit may be diminished if the parents of the household want children of high quality. As a result, the number of children decreases as investment on each child increases. So, it indicates that using contraceptive techniques is a way for educated women to reduce the indirect costs related to the high fertility rate (Chen, & Guo, 2022).

Additionally, participation in the educational system may be incompatible with motherhood, which can have a "incarceration effect" (Chen, & Guo, 2022). In a similar vein, education can support pregnancy and persuade women to use contraceptives in order to meet academic requirements. Since education promotes women's independence and autonomy in their capacity to make decisions for their health and the household, this is another way that education influences the choice of contraception (Prasad, 2022). Finally, educated women are more likely to have good views towards family planning and to be more knowledgeable about reproductive health than uneducated women, making them better able to learn and use contraceptive techniques (Munn, Vaughan, Talaulikar, Davies, & Harper, 2022). Women are more likely to go to health facilities to learn about their health and the best ways of birth control. These abilities enable education to raise a woman's likelihood of using contraception in comparison to women without education, as demonstrated by researchers in Uganda who found that female education, particularly at the secondary and post-secondary levels, raises the likelihood of using contraceptives (Prasad, 2022). Although the link between education and the use of contraception is now widely established, further research is still needed to determine how education affects the choice of contraceptive technique because of the contradictory findings in the literature. Because they are more aware of and have access to the most effective birth control options, studies suggest that educated women are more likely to utilise modern contraceptive methods than traditional ones (Alpu & Fidan 2006). To properly observe periodic abstinence or withdrawal, however, utilising traditional methods necessitates cooperation from the male partner (i.e., enough autonomy) and understanding of the menstrual cycle. So, educated women are better able to convince their partners to cooperate with them during the

withdrawal and abstinence period since they are more knowledgeable of their menstrual cycle (Tripathy, 2022). By doing so, even educated women could use conventional methods more effectively than uneducated women. Because it is difficult to predict ex ante, the influence of education on contraceptive strategy is therefore mainly empirical. This research uses PDHS 2017–18 data to analyze the association between female education and contraceptive method use in Pakistan.

H1: Maternal education has a positive impact on the adoption of contraceptive methods for birth spacing.

Methods and Material

The secondary data from the Pakistan Demographic and Health Survey (PDHS) 2017–18 was used by the author in the present study. A sample of 13558 married females aged 15–49 was selected for the data analysis. The two-stage stratified sampling design was adopt for the PDHS 2017–18. The division of the eight districts into urban and rural territories has been stratified. There was a total of 16 testing layers created. The samples have exclusively chosen in each layer in a two-stage selection procedure. The information in the survey has given in detailed about the age of the respondents, their level of education, the utilization of contraceptives, and the financial qualities of wedded ladies. For the examination, data has gathered from married ladies to evaluate the connection between their maternal levels of education and the utilization of contraceptives. In this manner, there are 13,558 females, incorporating 6351 in urban zones and 7207 in rural zones. A bivariate analysis has applied to study the association between the mother's level of education and birth control methods. The chi-square test has used in each variable (maternal education, place of residence, region, and economic situation of the respondents) to see if these factors are affecting the use of contraceptives.

Dependent variable

The dependent variable (contraceptive use) is measured as a dichotomous variable that takes the value of 1 if the respondent is not currently using contraceptives and 2 if she is using any contraceptive methods. Only married women aged 15–49 have asked the question about contraceptive use.

Control variables

Women's current age, wealth index, region, educational level, and residence are control variables for predicting the association between mothers' educational level and contraceptive use. The education variable is measured in four categories: not educated, primary, secondary, and higher, with the perception that completing a certain level of education may be critical in promoting contraceptive adoption behavior. To highlight the region wise comparison related to adoptability of birth control methods, sample has divided into six categories: Punjab, Singh, KPK, Baluchistan, Ghilgit-Baltistan, and Islamabad (ICT). According to socio-economics status sample as well divided into three categories: low, medium, and high. The residence is categorized as "urban" and "rural" to see whether urban exposure influences contraceptive use among women.

Results

Table I
Socio-demographic characteristics of the variables (N=13558)

Characteristics	Frequency	Percentage
Age of Respondents (years)		
Range	(15 to 49)	
Mean	32.69	
Standard Deviation	±8.546	
Region		
Punjab	3800	28.0
Sindh	2941	21.7
Khyber Pakhtunkhwa	2695	19.9
Balochistan	1953	14.4
Gilgit Baltistan	1216	9.0
Islamabad (ICT)	953	7.0
Educational level		
No Education	7625	56.2
Primary	1831	13.5
Secondary	2415	17.8

Cont..... (N=13558)

Characteristics	Frequency	Percentage
Higher	1687	12.4
Wealth Index		
Poor	5072	37.4
Middle	2589	19.1
High	5897	43.5
Residence		
Urban	6351	46.8
Rural	7207	53.2
Contraceptive use		
Not Using any Method	8907	65.7
Using any Method	4651	34.3

The table I depicts the demographic characteristics of the respondents. In this regard, data showed that mean of the age variable is 32.69 years, ranging from 15 to 49 years. However, the majority of the respondents (28.0) belonged to Punjab Province, with the frequency of 3800, and the lowest responses have taken from Islamabad, with the frequency of 7 percent. Moreover, the majority of the respondents (56.2 percent) were illiterate had a high wealth index, and were living in rural areas. Regarding the response to using contraceptive practice, the majority (65.7 percent) were not using any contraceptive method to control the birth rate.

Table II
Percentage of contraceptive use and maternal educational level (N=13558)

Maternal Educational level	Contraceptive Use				
	Using any Method		Not Using Any Method		*p*-value
	F	%	*F*	%	0.000
Not educated	2094	45.0	5531	62.1	
Primary	791	16.1	1080	12.1	
Secondary	982	21.1	1433	16.1	
Higher	824	17.7	863	9.7	

The table II mentioned above shows data regarding the percentage of contraceptive use and maternal educational level. Because of this data showed that the literate female has low tendency (9.7 percent) to reject the birth control measures as compare to the illiterate ones (62.1 percent). The table III shows data regarding percentage of contraceptive use and locality of the respondents. The data indicates that the married women who living in cities have high frequency (56.4) in comparison to rural area (43.6) in adopting contraceptive measures to control birth rate.

Table III
Percentage of contraceptive use and Residence of the respondents

Maternal Educational level	Contraceptive Use				
	Using any Method		Not Using Any Method		*p*-value
	F	%	*F*	%	0.000
Urban	2622	56.4	3729	41.9	
Rural	2029	43.6	5178	58.1	

Table IV
Percentage of contraceptive use and region of the respondents

Maternal Educational level	Contraceptive Use				
	Using any Method		Not Using Any Method		*p*-value
	F	%	*F*	%	0.000
Punjab	1494	32.1	2306	25.9	
Sindh	893	19.2	2048	23.0	
KPK	830	17.8	1865	20.9	
Baluchistan	445	9.6	1508	16.9	
GB	449	9.7	767	8.6	
Islamabad	540	11.6	413	4.6	

The table IV shows that according to the region, the married women tendency towards the acceptance of birth control methods. The given data indicates that the female who are living in the Punjab province of Pakistan have higher adoptability of contraceptive methods (32.1 percent) as compare to the other four provinces of Pakistan. On the other hand, Baluchistan province of Pakistan has lowest numbers in sense of contraceptive use than any other province of Pakistan (9.1 percent).

Table V
Percentage of contraceptive use and wealth index of the respondents

Maternal Educational level	Contraceptive Use				
	Using any Method		Not Using Any Method		*p*-value
	F	%	*F*	%	0.000
Poor	1181	25.4	3891	43.7	
Middle	873	18.8	1716	19.3	
High	2597	55.8	3300	37.0	

The above-mentioned table describes the number of married females using birth control of different social classes. The data indicates that the people of higher class of the society have great tendency of contraceptive use (55.8 percent). It draws that the people of higher class gave space to their spouses in the decision making especially related to the number of children. However, surprisingly, the respondents who fall in poor class (25.4 percent) have higher tendency of using contraceptive practices in comparison with middle class (18.8) of married females.

Discussion

The findings of our investigation make it obvious that various social elements affect contraceptive use in Pakistan. We can infer from our study that the higher educational level of women, a better economic situation, and female autonomy lead to more family planning among husband and wife, which is helpful for the advancement and use of different fertility control methods among couples. The different studies that were done in the developing regions related to the current study show a positive relationship between the maternal level of education and fertility control methods among married couples (Chauhan & Nagarajan, 2018; Adjiwanou, Bouma, & LeGrand, 2018; Ba, Ssentongo, Agbese, & Kjerulff, 2019). The trends and knowledge about the different population control methods were high in the educated people (Altbach, Reisberg, & Rumbley, 2019). Accordingly, a study conducted in southern Ethiopia and Korea indicated a strong relationship between women's education and fertility control methods (Nebro, Acres, & Prasad, 2019).

According to WHO (World Health Organization) studies, which demonstrated that knowledge about modern contraceptive methods is not common among women in developing countries (Zulliger, 2018), educated couples did not feel any hesitation in discussing the number of children and the duration between one child and another (Bueno & Brinton, 2019). In Pakistani society, it was very tough to inspire low-income families to adopt family planning or birth control methods as they preferred a larger family size as a source of income (Biberman, 2019). This argument emphasizes the importance of the wealth index, which is also crucial in contraceptive methods. A study conducted in Ethiopia by Abdissa, Taji, and Agata (2018) found that education was not the only factor in the acceptance of contraceptive use but that another factor, the wealth index, played an important role in the acceptance of contraceptive use. The husband-wife agreement on birth control methods and family size are exceptionally noteworthy in clarifying the higher utilization of preventative methods (Kheir, 2018). In summary, the study findings show that a lack of education leads to a communication gap between husband and wife, fewer women's autonomy, and less decision-making power over family size, all of which contribute to a low level of contraceptive use (Balasubramanian, 2018; Malik, Javed, & Mahmood, 2022). In Pakistani society, the husbands remain dominant in all the decision-making processes. Still, the economic independence of the females, which comes from education, plays an effective role in defining the number of children and controlling unwanted pregnancies by using different fertility control methods (Rehman, 2018).

Conclusion

Using DHS (2017-18) data, the study concluded that maternal level of education plays an important role in the acceptance and use of various fertility control methods in different regions of Pakistan. The assumption is that education is one of the most important social factors in promoting contraceptive use and that birth control methods are accepted. The positive attitude towards contraceptive use, family planning, and the trend to visit healthcare centers has been seen more in educated women than in uneducated women. The awareness and knowledge of different modern contraceptive methods are higher in urban areas than rural ones. The results also verify that the economic situation and region of the respondents affect the use of contraceptive methods. According to the wealth index and place of residence of the respondents fund some differences related to the acceptance of birth control measures. The study's finding not only

shows the relationship between the level of maternal education and contraceptive use but also helps examine the wider benefits of female autonomy and decision-making related to the number of children.

Limitations of the Study

Even though this study has many benefits, there are several limitations to be aware of. It is based on cross-sectional data, which makes it difficult to infer causal relationships. Secondly, It was the limitation of the study that the in-depth data from the married female related to the acceptability of contraceptive methods required for the understanding of detailed description regarding to the family planning. The PDHs lack of measurements of reproductive autonomy and coercion is a third limitation. One mechanism through which choosing to use contraception is converted into use is reproductive autonomy. Finally, when women claim that someone other than they or their husband made the choice to use contraception, we are unable to identify the decision-maker. This "other" decision-maker could be your mother-in-law, another relative, or a medical professional. This is a regrettable restriction because these two possibilities have quite different ramifications. In the case of healthcare professionals, recommended activities may include values clarification and updated technical training; in the case of in-laws, recommended actions may include social behaviour change and communication initiatives aimed at older women and community members.

Recommendations

The study also suggests more work in this field. Firstly, it is important to create awareness about preventative and birth control methods. Secondly, it is necessary to educate women especially about family planning and its benefits. Thirdly, the government should take important steps to create female quota in jobs which plays effective role in the independency of female that ultimately gives female confidence to take part in decision making related to size of family members. Lastly, the government should start an awareness campaign especially encourage females to discuss matters with their spouses related to family number.

Furthermore, through awareness campaigns couples should give more information and services to freely and thoughtfully decide the number and age gap of their children. To control the birth rate, the government should analyze marriage age and pass a law prohibiting early childhood marriage which directly affects the fertility level. Moreover, awareness about family planning should be provided in different regions, especially in rural areas. At the end, it's essential for policymakers to make such policies that improve the status of women in society so that they can participate at all stages of developing the nation.

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