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Original Article

Effects of sociodemographic background on fertility motivation patterns in the Beni-Suef governorate, Upper Egypt

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الكلمات المفتاحية: المباعدة بين الولادات؛ الرغبة في الإنجاب؛ طرق تنظيم الأسرة؛ الخصوبة؛ دوافع الخصوبة؛ النمو السكاني

الملخص

أهداف البحث: يمكن أن يكون التقييم الشامل لدوافع الإنجاب في محافظة بني-سويف مفيدا في فهم أفضل لأنماط الخصوبة ووضع سياسات وبرامج عائلية مناسبة لتقليل معدلات الخصوبة ومعالجة مشكلة الزيادة السكانية في صعيد مصر.

طرق البحث: أجريت هذه الدراسة المقطعية من مايو ٢٠١٩ إلى مايو ٢٠٢١ على ١٠٨٥ سيدة متزوجة حضرت إلى أي من مرافق الرعاية الصحية الأولية في المناطق الريفية والحضرية في محافظة بني-سويف لتقييم دوافعهم المتعلقة بالإنجاب.

النتائج: أظهرت هذه الدراسة أن ٤٢٫١٪ من المشاركات لديهم رغبة إيجابية للإنجاب و٤٥٪ من المشاركات لديهم رغبة سلبية للإنجاب، بينما بقية المشاركات (١٢٫٩٪) لديهم دوافع مترددة. كان الدافع الأكثر انتشارا بين المشاركات هو حب الأطفال (٤٠٫٨٪). بينما كان الدافع الأكثر سلبية للخصوبة بين العينة المدروسة هو الظروف الاقتصادية (٤٤٫٧٪). كان هناك اختلافا ملحوظا بين السيدات المشاركات لدوافع الخصوبة المختلفة بما يخص العمر، التعليم، سن الزواج، مدة الزواج، عدد أفراد الأسرة، الدخل الشهري، الوظيفة، عدد مرات الحمل، عدد مرات الإنجاب، استخدام موانع الحمل، و مدة استخدامها ووجود الأمراض المزمنة.

الاستنتاجات: هناك حاجة شديدة لإشراك الأزواج الشباب الذين لم يبلغوا بعد حجم الأسرة المرغوب والذين لا يستخدمون طرق تنظيم الأسرة في برامج تنظيم الخصوبة.

Abstract

Objectives: A comprehensive assessment of childbearing motivations in the governorate of Beni-Suef was conducted to better understand fertility patterns, and to develop appropriate familial policies and programs to reduce fertility rates and address the problem of overpopulation in Upper Egypt.

Subjects and methods: A cross-sectional study was conducted from May 2019 to May 2021. A total of 1085 married women who attended any health care service in rural or urban primary health care facilities in the Beni-Suef governorate were included in the study.

Results: The results revealed that 42.1% of participants had a positive desire for childbearing, and 45% of participants had a negative desire for childbearing; the rest of the participants (12.9%) had undecided motivations. The most prevalent positive motive for childbearing was a love of children (40.8%), whereas the most prevalent negative motive for childbearing was economic circumstances (44.7%). A statistically significant difference was observed in fertility motivations among the studied women, depending on age, education, husband's education, age at marriage, marriage duration, number of living siblings, monthly income, occupation, gravidity, parity, and chronic diseases ($p = 0.001$).

Conclusion: A great need exists to involve young couples who have not yet attained their desired family size and who do not use family planning methods, in fertility regulation interventions.

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Introduction

According to UN data, Egypt's recent spike in fertility is an unexpected and concerning aberration in the Arab world's most populous country, whose population has doubled since the early 1980s and reached 102,334,404 people by mid-2020.[1]

The total fertility rate increased to 3.5 in Egypt's Demographic and Health Survey (EDHS) 2014, compared with 3.0 in the 2008 EDHS, thus reversing a 25-year trend of declining fertility. The rise in the total fertility rate corresponded to a convergence of fertility rates across educational levels, and evidence has indicated a trend toward birthing at younger ages among highly educated women, which might be responsible for inflating period measures of fertility.[2] The rise in fertility rates is widely attributed to post-revolutionary social and political upheaval, possibly because of disruptions in family planning services or an increase in the proportion of young women marrying in response to safety concerns; a similar trend has been observed in other Middle Eastern countries during times of conflict.[3] After a decline in adolescent marriage, the mean age at first marriage among Egyptian women has risen; however, some evidence indicates that this trend in marriage postponement has reversed among recent birth cohorts, thus possibly contributing to the rise in fertility rates.[4] According to recent studies, fertility is influenced by individuals' choices, as well as social norms, beliefs, and culture.[5]

Fertility motivation is a complex topic with origins in culture, behavior, and beliefs. It has positive and negative dimensions. Examples of positive fertility motivation include personal motivations for having children, enjoyment of fertility, having a conventional worldview, contentment with child-rearing, a sense of need and survival, and instrumental values of a child. Negative fertility motivations include fear of becoming a parent, parental stress, and childcare concerns.[6] Positive fertility motivation can lead to a higher tendency toward childbearing, a greater number of children, and shorter birth intervals.[7] In addition, a positive direct relationship exists between positive fertility motivation in couples who have an ideal number of children.[8] Thus, understanding the nature of the recent increase in the total fertility rate is critical to informing population policy.

Egypt's rapid annual population growth rate poses a threat to economic development; the environment, particularly in terms of severe freshwater shortages; and the provision of services, such as education and healthcare.[9] Maternal and child mortality remain major health problems. Short birth intervals have been associated with a variety of adverse maternal and child health outcomes, including infant and maternal mortality. According to one estimate, avoiding birth intervals of less than 2 years could avert approximately 2 million of the 11 million deaths of children under the age of five that occur each year. The World Health Organization currently advises a birth interval of at least 24 months between the last live birth and the next pregnancy, for a birth interval of 33 months.[10]

Previous studies on fertility and high population growth in Egypt have assessed the population's current fertility behavior and ideal number of children, and their progression over time by using data from EDHS in 2014, for example, reference.[11] However, the present study examined the determinants and motivations for fertility in the governorate of Beni-Suef, with an aim to help reduce the fertility rates to benefit both mothers and children.

Hypothesis

- High fertility motivation remains a devastating problem in the Beni-Suef governorate, one of the most populous governorates in Upper Egypt.
- High fertility motivation is usually significantly associated with sociodemographic determinants, such as cultural and belief background.
- Acquiring research-based knowledge regarding fertility motivation in the Beni-Suef governorate will be a key step to guide policymakers in planning appropriate interventions.

Materials and Methods

Study design and settings

The study was designed as a cross-sectional analytical study and was conducted from May 2019 to May 2021. The study was performed in urban and rural primary health care facilities in Beni-Suef governorate, Upper Egypt. The total population of the governorate is approximately 3,282,692. The Beni-Suef governorate is administratively classified into seven districts. Each district is divided into one city, which is subdivided into several local administrative units. Small villages are affiliated with these units.

Population sampling

Sampling was performed through a multistage sampling technique. The first stage was at the level of districts in the Beni-Suef governorate. Four of the seven districts in the Beni-Suef governorate were randomly selected through a simple random sample. The second stage was at the level of primary health care facilities. One rural and one urban primary health care facility were selected randomly from a list of all rural and urban primary health care facilities in each district. The third stage was at the level of married women, through a non-probability convenience sampling procedure. From each facility, the total population of all married women attending the facility for any health service during the 6 months of data collection had been included in the sample. The participants were informed about the

objectives of the study and were not obliged to participate in the study, and informed consent was obtained from each participant. The self-administered questionnaire clearly stated that data would be confidential and anonymous, thus assuring the respondents that socio-demographic questions would be only for identifying their characteristics, not their identity.

Sample size

The sample size was calculated with the following equation:

$n = Z^2 P(1 - P) \div d^2$ where n is the sample size, Z is the statistic corresponding to a level of confidence, P is expected prevalence, and d is precision (corresponding to effect size). The minimum required number of participants was 384 for a confidence level of 95%. To enhance the power of the study, a larger number of participants, 1085 married women, was included.

Ethical considerations

The participants were informed about the objectives of the study and were not obliged to participate in the study, and informed consent was obtained from each participant. The self-administered questionnaire clearly stated that data would be confidential and anonymous, thus assuring the respondents that socio-demographic questions would be only for identifying their characteristics, not their identity.

Study tool

A self-administered questionnaire was designed for data collection. The questionnaire was collected through interviews in a key informant interview structure. This form was classified into three sections. Section I focused on the personal and sociodemographic characteristics of the studied population, such as residence, age, education, occupation, age at marriage, years of marriage, religion, number of family members, consanguinity, and income. Section II focused on the reproductive and medical history of the studied population. Section III focused on the positive and negative fertility motives and preferences of the studied population. Positive fertility motives included economic support to the family, the sex of the baby, the protection provided by a large family size, the husband's willingness, love of children, and proving fertility. Negative fertility motives include the economic cost of child-rearing, unstable familial relationships, occupational motives, aging and health problems, and older children's refusal.[12] To avoid participation bias that might occur after distributing self-administered questionnaires in a community with a high illiteracy rate, we decided to administer the questionnaire orally. Accordingly, the first author of this study visited the selected facilities 2 days per week during the 6 months of data collection and interviewed the participants.

Statistical analysis

All collected questionnaires were revised for completeness, and items were then transferred to Statistical Package of Social Science Software program, version 25 for statistical analysis. Qualitative variables are described by frequency and percentage, and quantitative variables are reported as range, mean, and standard deviation (mean $\pm$ SD). Chi-square (χ^2) test, one-way analysis of variance, and multinominal logistic regression analysis were used. The significance level (p) was considered significant when p $\leq$ 0.05.

Results

Participant characteristics

The present study involved 1085 married women. Approximately two-thirds of the studied women were in the
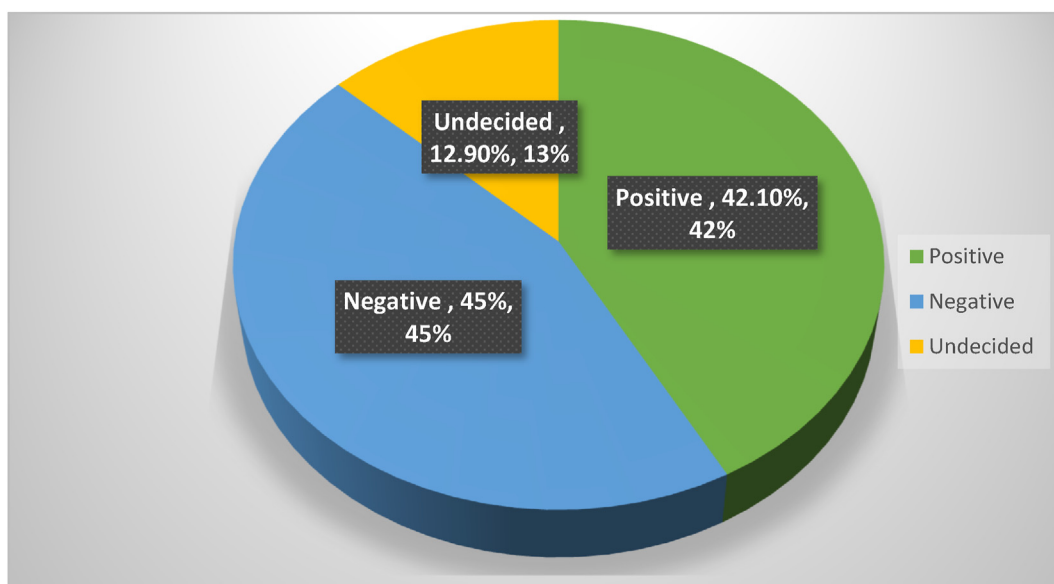

Figure 1: Distribution of the studied women according to their fertility motivations, ($n = 1085$).
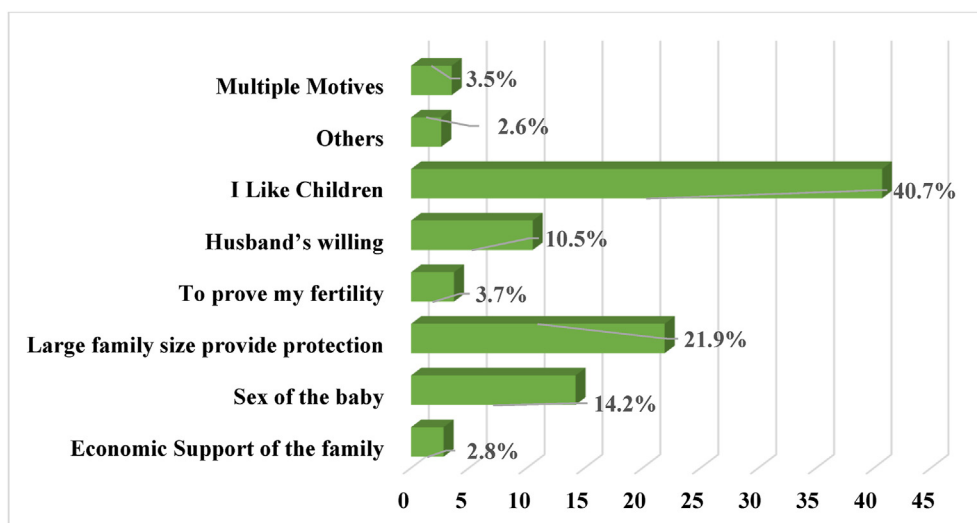
Figure 2: Positive fertility motivations among the studied women ($n = 457$).

age group 18−35 (65.3%). More than two-thirds of women had secondary and university education (38.6% and 39.7%, respectively). Most participants were married at the age of 18 years or older (72.3%). Housewives accounted for 60.1% of the participants. Approximately two-thirds of the husbands had received secondary and university education (38.9% and 44.7%, respectively), and almost all were working (94.86%). Negative consanguinity was present in two-thirds of the participants (66.5%). The number of family members among the studied women was 4.46 ± 1.66 (mean ± SD). The largest percentage of the studied women were multigravida (2−4) (58.9%; 2.92 ± 1.92). In addition,

80.1% of the participants were multipara (2.83 ± 1.57). Most participants had spaced births and breastfed their children (82.8% and 91.3%, respectively). More than half of the women were contraceptive users (56.9%), and 20.4% had chronic diseases.

Fertility desire and motivations

According to the studied women's opinions, the mean ideal number of children was 3.0 ± 1.0. The largest percentage of participants made fertility decisions with their

Table 1: Associations between sociodemographic characteristics and fertility motivations.

| Sociodemographic Characteristics		Fertility motivation ($n = 1085$)			*p*-value
		Positive	Negative	Undecided	
		n (%)	*n* (%)	*n* (%)	
Residence	Rural	253 (41.41)	275 (45.01)	83 (13.58)	0.715
	Urban	204 (43.04)	213 (44.94)	57 (12.02)	
Age in years	<18	16 (69.57)	3 (13.04)	4 (17.39)	0.001*
	18−35	389 (54.94)	212 (29.95)	107 (15.11)	
	≥36	52 (14.69)	273 (77.12)	29 (8.19)	
Education	Illiterate or primary	42 (23.60)	117 (65.73)	19 (10.67)	0.001*
	Secondary	179 (42.42)	204 (48.34)	39 (9.24)	
	University	236 (48.66)	167 (34.43)	82 (16.91)	
Age at marriage	Mean ± SD	21.33 ± 3.37	20.14 ± 3.65	21.71 ± 3.56	0.001*
Years of marriage	Mean ± SD	6.57 ± 6.05	17.86 ± 10.38	9.49 ± 6.67	0.001*
Occupation	Housewife	258 (39.57)	321 (49.23)	73 (11.20)	0.002*
	Working	199 (45.96)	167 (38.57)	67 (15.47)	
Religion	Moslem	422 (41.82)	456 (45.20)	131 (12.98)	0.771
	Christian	35 (46.05)	32 (42.11)	9 (11.84)	
Husband's education	Illiterate and primary	42 (20.48)	117 (72.29)	19 (7.23)	0.001*
	Secondary	179 (42.42)	204 (48.34)	39 (9.24)	
	University	236 (48.66)	167 (34.43)	82 (16.91)	
Husband's occupation	Not working	17 (30.36)	32 (57.14)	7 (12.50)	0.143
	Working	440 (42.76)	456 (44.31)	133 (12.93)	
Consanguinity	Positive	148 (40.77)	166 (45.73)	49 (13.50)	0.797
	Negative	309 (42.80)	322 (44.60)	91 (12.60)	
Monthly income	Mean ± SD	2865.1 ± 1623.6	2752.8 ± 1721.8	3462.1 ± 2615.1	0.001*

*$p \leq 0.05$ is considered significant.
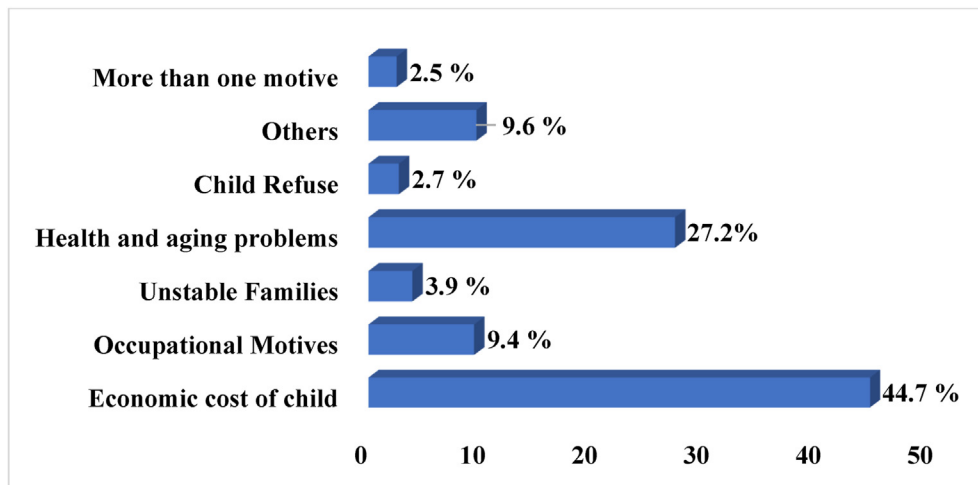
Figure 3: Negative fertility motivations among the studied women ($n = 488$).

Table 2: Association between obstetric and medical history and fertility motivation.

History		Fertility Motivations ($n = 1085$)			p-value
		Positive	Negative	Undecided	
		$n = 457$ (%)	$n = 488$ (%)	$n = 188$ (%)	
Gravidity	Nulligravida	80 (79.21)	7 (6.93)	14 (13.86)	0.001*
	Primigravida	114 (78.62)	17 (11.73)	14 (9.65)	
	Multigravida	263 (59.9)	464 (55.3)	112 (13.34)	
Abortion	Present	98 (41.70)	116 (49.36)	21 (8.94)	0.103
	Absent	279 (37.25)	365 (48.73)	105 (14.02)	
Parity	Nullipara	25 (92.6)	0 (0.0)	2 (7.4)	0.001*
	Primipara	134 (79.3)	23 (13.6)	12 (7.1)	
	Multipara	218 (27.7)	458 (58.1)	112 (14.2)	
Normal delivery	Mean ± SD	0.93 ± 1.30	2.46 ± 1.97	1.59 ± 1.63	0.001*
Cesarean section	Mean ± SD	1.11 ± 0.96	1.06 ± 1.30	1.14 ± 1.24	0.716
Complications after delivery	Present	102 (37.09)	148 (53.82)	25 (9.09)	0.066
	Absent	250 (36.66)	333 (48.83)	99 (14.51)	
Breastfeeding	Present	317 (36.27)	444 (50.80)	113 (12.93)	0.520
	Absent	35 (42.17)	37 (44.58)	11 (13.25)	
Birth spacing	Present	300 (37.88)	396 (50.0)	96 (12.12)	0.132
	Absent	52 (31.52)	85 (51.52)	28 (16.96)	
Living siblings	Mean ± SD	1.92 ± 1.02	3.56 ± 1.43	2.82 ± 1.24	0.001*
Chronic diseases	Present	50 (22.62)	144 (65.16	27 (12.22)	0.001*
	Absent	407 (47.11)	344 (39.81)	113 (13.08)	

*$p \leq 0.05$ is considered significant.

husbands (62.7%). Regarding fertility desire, approximately 42.1% of the participant had a positive desire for childbearing and were considered positively motivated women, whereas 45% of participants had a negative desire for childbearing and were considered negatively motivated women. The most prevalent positive motive was a love of children (40.8%) followed by thinking that a large family size provides protection (21.9%). The most prevalent negative motive was economic circumstances (44.7%), followed by health and aging problems (27.2%) (Figures 1–3).

Determinants of fertility motivations

The current study revealed a statistically significant difference in fertility motivations among the studied women according to age, education, age at marriage, duration of the marriage, occupation, husband's education, number of family members, and monthly income. The prevalence of positive fertility motivations was significantly higher among women >18 years old and 18–35 years old than in older women (69.57%, 54.94%, and 14.69%, respectively; $p = 0.001$). The mean age of marriage for positively motivated women and women with undecided fertility motivations was significantly higher than that for negatively motivated women (21.33 ± 3.37, 21.71 ± 3.56, and 20.14 ± 3.65, respectively; $p = 0.001$). Moreover, the mean number of years of marriage was significantly higher for negatively motivated women than positively motivated women and women with undecided motivation (17.86 ± 10.38, 6.57 ± 6.05, and 9.49 ± 6.67; $p = 0.001$). Regarding education, the prevalence of positive fertility motivations was significantly higher among women with secondary and university education than women who

were illiterate or had primary education (42.42%, 48.66%, and 23.60%, respectively; p = 0.001). Moreover, the prevalence of positive fertility motivations was significantly higher among working women than housewives (45.96% and 39.57%, respectively; p = 0.001). The prevalence of positive fertility motivations was significantly higher among husbands with secondary and university education than illiterate husbands (42.42%, 48.66%, and 20.48%, respectively; p = 0.001). The mean monthly income was higher for women with undecided motivations than for positively motivated and negatively motivated women (3462.1 ± 2615.1, 2865.1 ± 1623.6, and 2752.8 ± 1721.8, respectively; p = 0.001) (Table 1).

Table 2 shows a higher prevalence of positive motivations in nulligravida and primigravida than multigravida (79.21%, 78.62%, and 59.9%, respectively; p = 0.001). Moreover, the prevalence of positive motivations was higher in nullipara and primipara than multipara (92.59%, 79.3%, and 27.7%, respectively; p = 0.001). In addition, positively motivated women experienced significantly fewer vaginal deliveries than negatively motivated women (0.93 ± 1.30 versus 2.46 ± 1.97, respectively; p = 0.001). The mean number of living siblings was significantly higher for negatively motivated women than positively motivated women and women with undecided motivations (3.56 ± 1.43, 1.92 ± 1.02, and 2.82 ± 1.24, respectively; p = 0.001). The prevalence of positive motivations was significantly lower in women with chronic diseases than healthy women (22.62% and 47.11%, respectively; p = 0.001).

Discussion

The fertility desires among men and women are a strong indicator of future childbearing and are a factor influencing population growth in developing countries.[13] Casterline and Roushdy have stated that a decline in fertility desire is necessary for a further decline in fertility rates.[14]

The present study demonstrated that approximately 42.1% of participants had a positive desire for childbearing, 45% of participants had a negative desire for childbearing, and the rest of the participants had undecided motivations 12.9% (Figure 1). This finding is partially in agreement with results from references 15 and 16, in which most participants had negative fertility desire (60% and 55%, respectively). In contrast, this finding disagreed with the results in reference 17, in which 63.1% of participants had positive fertility desire explaining the high prevalence of positive motivations, and only 30% of participants reported that they had attained their desired family size.

The most prevalent positive fertility motive in this study was love of children (40.8%), which was followed by the protection provided by a large family size (21.9%) and child sex (14.2%). The most prevalent negative motive was economic circumstances (44.7%), which was followed by health and aging problems (27.2%) (Figures 2 and 3). These findings partially agree with those from a study in Iran indicating fertility and enjoyment of childhood as the most prevalent positive motives, and the fear of being a parent as the most prevalent negative motive.[18] This inconsistency may be attributable to cultural and socioeconomic circumstances.

The present study demonstrated that positive fertility desire was higher among younger women (younger than 35 years of age), highly educated partners, a delayed age at marriage, shorter marital duration, working for cash, higher mean monthly income, nulligravida, primigravida, nullipara, primipara, fewer vaginal deliveries, fewer living siblings, and an absence of chronic diseases (Tables 1 and 2).

Our findings regarding women's age were in accordance with those in prior studies[15–21] but contrast with the results of a study by Farouk-Eslamlou, in 2013 in Urmia. According to that study, the age variable was not associated with couples' fertility desire in terms of the number of future generations.[22] These differences among results might have been due to the different target groups, given that Farouk-Eslamlou's study was performed at the premarital stage.

Education is often regarded as one of the most important socio-economic factors influencing fertility.[23] Various studies have provided two basic arguments regarding the influence of education on fertility. One is that schooling may raise the cost of having children. According to Miller, having children is inversely associated with educational attainment, because education itself and the related opportunities promote pursuits incompatible with childbearing.[24] Another argument is that women with higher education are more inclined to prioritize child quality over number of children. These two possibilities indicate a negative association between the desire to have children and women's educational attainment, as revealed by several research studies, including one by Jiang and Hardee.[25]

In contrast, other studies have indicated positive associations between women's level of education and their fertility intentions, in agreement with our findings.[17] Considering the importance of fertility intention as a conduit through which education influences fertility, the relationship between fertility intentions and education is not always the same as the relationship between actual fertility and education.[26] Although highly educated women intend to have more children than less educated women, research has indicated that they have fewer children than planned and would prefer to decrease their fertility intention.[27] Together, these findings suggest that the effects of women's education on desired fertility are complex, particularly in certain socioeconomic circumstances. The present study's findings regarding education were also in agreement with the *EDHS 2014* survey reporting that the proportion of women wanting no more children generally declines with increasing educational level among women. To some extent, this pattern reflects the interconnections among a woman's age, education level, and fertility preferences. Educational levels are higher among younger women than older women, and younger women are more likely to want another child than older women.[15] Moreover, delayed marriage among highly educated women is associated with reporting not yet having attained the desired family size.[28]

The present study demonstrated that the prevalence of positive fertility motivations was higher among nulligravida, nullipara women with delayed age at marriage and a short duration of marriage (Tables 1 and 2). These findings agree with those of *EDHS 2014.* The increase in positive

motivations observed herein can be explained by the women not yet having achieved the ideal number of children.

The total number of siblings of a woman and her spouse is referred to as the number of siblings. According to several studies, as the number of living children increases, people's desire for children decreases.[17–28] This finding is consistent with the results of our study (Table 2).

According to a review of the literature, the relationship between income and the number of children might be positive or negative. A positive association between income and the number of children may be implied if individuals derive direct pleasure from having and raising children.[29] This argument agrees with the findings of the present study, because the mean monthly income for positively motivated women and women with undecided motivations was higher than that of negatively motivated women, at $p = 0.01$ (Table 2). Moreover, when women were asked about the motives for their desires, the most frequently reported positive motive was liking children, and the most frequently reported negative motive was the economic cost of a child (Figures 2 and 3).

A substantial body of literature, in contrast, has offered two opposing perspectives on the negative association between income and the number of children. One perspective emphasizes the tradeoff between child quality and number of children, arguing that parents with higher income value their children's quality and consequently have fewer children within their given economic limitations.[29] The opposite point of view recognizes that women's income lost during childbirth and childrearing is a key part of the opportunity cost of having children, thus implying that higher-income mothers are more likely to have fewer children, because fertility is more costly to them.[30] Consequently, the substitution effect between child quality and number of children, as well as income spent on having children, may reduce women's desire to have children.[31]

Conclusion and recommendations

The study revealed that some sociodemographic, obstetric, and medical history variables regarding women and their husbands significantly affected the studied women's childbearing desire. Consequently, a strong and urgent need exists to involve men as a key target group in fertility control interventions, in addition to young couples who have not yet reached their desired family size, and non-users of family planning methods. To enhance the prevalence of contraceptive use and satisfaction, health practitioners should arrange educational programs and counseling sessions for women regarding the adverse effects of contraceptive methods and how to choose a suitable method. Finally, to improve understanding of these challenges, further qualitative research on fertility and the relationship between education and fertility is highly recommended.

Source of funding

Conflict of interest

The authors have no conflicts of interest to declare.

Ethical approval

Authors' contributions

GSA constructed, distributed, and collected the questionnaires. LS and GSA conceived and designed the study. GSA analyzed and interpreted data. GSA wrote the initial and final draft of the manuscript under the supervision of EME, RSE, and HRA. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

References

1. United Nations. https://www.worldometers.info/world-population/egypt-population (Accessed 2021 August 10).
2. Radovich E, El-Shitany A, Sholkamy H, Benova L. Rising up: fertility trends in Egypt before and after the revolution. **PLoS One 2018 Jan 18**; 13(1): e0190148.
3. Cetorelli V. The Effect on the fertility of the 2003±2011 war in Iraq. **Popul Dev Rev 2014**; 40. https://doi.org/10.1111/j.1728-4457.2014.00001.x. 581–604. PMID: 26300572.
4. Salem R. Changes in the institution of marriage in Egypt from 1998 to 2012. In: *The Egyptian labor market in an era of revolution*; 2015 May 28. pp. 162–181.
5. Hosseini H, Begi B. Determinant of economic, social, cultural and demographic trends childbearing women Married referred to health centers in. **Hamadan 2012**.
6. Zare Z, Saffari E, Tabar RK. Fertility motivations and their relation with attitude towards Government incentives for childbearing in women of reproductive age. **J Maz Univ Med Sci 2018 Jan 1**; 28(162): 104–114.
7. Miller WB, Millstein SG, Pasta DJ. The measurement of childbearing motivation in couples considering the use of assisted reproductive technology. **Biodemogr Soc Biol 2008 Mar 1**; 54(1): 8–32.
8. Khadivzadeh T, Arghavani E, Shakeri MT. Relationship between fertility motivations and preferences in couples. **Iran J Obstet Gynecol Infertil 2014**; 17(114): 8–18.
9. Youssef H, Osman M, Roudi-Fahimi F. *Responding to rapid population growth in Egypt*. Washington, DC: The Population Reference Bureau, PRB Policy Brief; 2014.
10. Pimentel J, Ansari U, Omer K, Gidado Y, Baba MC, Andersson N, et al. Factors associated with a short birth interval in low-and middle-income countries: a systematic review. **BMC Pregnancy Childbirth 2020 Dec**; 20(1): 1–7.
11. Ambrosetti E, Angeli A, Novelli M. Ideal family size and fertility in Egypt: an overview of recent trends. **Statistica 2019 Aug 6**; 79(2): 223–244.
12. Guedes M, Pereira M, Pires R, Carvalho P, Canavarro MC. Childbearing motivations scale: construction of a new measure and its preliminary psychometric properties. **J Child Fam Stud 2015 Jan 1**; 24(1): 180–194.

13. Morgan SP, Rackin H. The correspondence between fertility intentions and behavior in the United States. **Popul Dev Rev 2010 Mar**; 36(1): 91−118.

14. Casterline J, Roushdy R. *Slow fertility transition in Egypt*. Population Council, Cairo Demographic Center, and USAID; 2007 Mar.

15. EDHS, Ministry of Health and Population [Egypt], El-Zanaty and Associates [Egypt], and ICF International. *Egypt demographic and health survey 2014*. Cairo, Egypt, and Rockville, Maryland, USA: Ministry of Health and Population and ICF; 2015.

16. Saad Farrag N. Practice of Family Planning among married female attendants to Shawa family health unit, Dakahlia, Egypt. **Egypt Fam Med J 2020 May 1**; 4(1): 24−41.

17. Matovu JK, Makumbi F, Wanyenze RK, Serwadda D. Determinants of fertility desire among married or cohabiting individuals in Rakai, Uganda: a cross-sectional study. **Reprod Health 2017 Dec**; 14(1). 1-1.

18. Zare Z, Kiaetabar R, Laal Ahangar M. Fertility motivations and its related factors in women of reproductive age attended health centers in Sabzevar, Iran. **J Midwifery Reproductive Health 2019**; 7(1): 1544−1552.

19. Azmoude E, Behnam H, Barati-Far S, Kabirian M. The relationship of socio-demographic factors, fertility behavior, and child's perceived value with fertility intention of women in a region in the east of Iran. **Int J Community Based Nurs Midwifery 2017**; 5(2): 123−133. 2017.

20. Motlagh ME, Taheri M, Eslami M, Shirvani DN. Factors affecting the fertility preference in Iranian ethnic groups. **J Urmia Nurs Midwifery Fac 2016**; 14(6): 485−495.

21. Abbasi Shovazi MJ, Khaje Salehi Z. Assessing the impact of independence, social participation, and education of women on the tendency to childbearing (a case study of Sirjan city). **Wom Dev Pol (Women's Research) 2013**; 11(1): 45−64.

22. Farrokh-Eslamlou HR, Vahabzadeh Z, Moeini R, Moghaddam Tabrizi F. Pre-marriage couples fertility attitude following recent childbearing persuasive policies in Iran. **Nurs Midwifery J 2014 Jan 10**; 11(10). 0.

23. Bongaarts J. Completing the fertility transition in the developing world: the role of educational differences and fertility preferences. **Popul Stud 2003**; 57(3): 321−335. https://doi.org/10.1080/0032472032000137835 PMID: 14602532.

24. Miller WB. Childbearing motivation and its measurement. **J Biosoc Sci 1995**; 27(4): 473−487. PMID: 7593054.

25. Jiang L, Hardee K. Women's education, family planning or both? Application of multistate demographic projections in India. **Int J Popul Res 2014**; 2014: 2014.

26. Testa MR. On the positive correlation between education and fertility intentions in Europe: individual and country-level evidence. **Adv Life Course Res 2014**; 21: 28−42. https://doi.org/10.1016/j.alcr.2014.01.005. PMID: 26047540.

27. Iacovou M, Tavares LP. Yearning, learning, and conceding: (some of) the reasons people change their childbearing intentions. **Popul Dev Rev 2011**; 37(1): 89−123. PMID: 21735613.

28. Heiland F, Prskawetz A, Sanderson WC. Are individuals' desired family sizes stable? Evidence from West German panel data. **Eur J Popul/Revue européenne de Démographie 2008 Jun 1**; 24(2): 129.

29. Wei J, Xue J, Wang D. Socioeconomic determinants of rural women's desired fertility: a survey in rural Shaanxi, China. **PLoS One 2018**; 13(9):e0202968. https://doi.org/10.1371/journal.pone.0202968.

30. Van Bavel J. Choice of study discipline and the postponement of motherhood in Europe: the impact of expected earnings, gender composition, and family attitudes. **Demography 2010**; 47: 439−458. PMID: 20608105.

31. Werding M. Children are costly but raising them may pay: the economic approach to fertility. **Demogr Res 2014**; 30(8): 253−276.