RESEARCH ARTICLE

Investigating cultural, social, and economic influences on reproductive trends among women in Saudi Arabia

Lateefa Othman Aldakhil[1], Ghaida Saad Alsanad[2], Meaad Faiz Alnofaie[3], Leena Khalid Alrahmah[4], Balqes Faisal Alrajhi[5]

Abstract

Objective: To quantify fertility patterns in terms of age, parity and reproductive outcomes among married women, to evaluate the association between early marriage and higher parity, and to identify lifestyle and medical factors influencing reproductive patterns.

Method: The cross-sectional study was conducted in Saudi Arabia from September 2021 to August 2022, and comprised data of married or formerly married women. Data collection was carried out at selected tertiary hospitals across different regions of the country: King Khalid University Hospital, Riyadh (Central region); King Fahad Specialist Hospital, Dammam (Eastern region); Arar Central Hospital (Northern region); Asir Central Hospital, Abha (Southern region); and Maternity & Children Hospital, Makkah, together with King Abdulaziz University Hospital, Jeddah (Western region). Data was analysed using SPSS 23.

Results: A total of 2488 married or previously married women were included. The Western region contributed the largest proportion (1090/2488; 43.8%), followed by the Central region (757/2488; 30.4%). More than one-third were aged >40 years (878/2488; 35.3%), while 804/2488 (32.3%) were aged 31–40 years. Most women married between 22–30 years (1199/2488; 48.2%), and 1281/2488 (51.5%) had their first child in the same age category. Regarding parity, 1198/2488 (48.2%) had 1–3 children, 840/2488 (33.8%) had 4–6 children, and 275/2488 (11.1%) were nulliparous. Early marriage, lower education, smoking status, mode of delivery, contraception use, and family size planning showed statistically significant associations with parity ($p < 0.001$ for most variables).

Conclusion: Cultural, social and economic factors, particularly age at marriage, were found to shape reproductive patterns among Saudi women.

Keywords: Fertility, Family planning, Reproductive health, Parity, Cultural factors, Socioeconomic factors, Cross-sectional studies. (JPMA 76: 681; 2026) **DOI: https://doi.org/10.47391/JPMA.22232**

Introduction

Since 1950, global fertility rates have significantly declined, largely due to advancements in education, healthcare and economic development. These factors have contributed to increased life expectancy, decreased child mortality, and improved family financial stability worldwide.[1] Among the pivotal drivers of this trend is the increased level of women's access to education, which has led to delayed marriage, reduced fertility, and shifts in societal norms surrounding reproductive behaviours.[2,3]

In addition to education, the widespread availability and adoption of modern contraceptive methods — particularly following the United States Food and Drug Administration's approval of oral contraceptive pills (OCPs) in 1960 — have profoundly shaped fertility decisions. Initially adopted by married women and later by single women, OCPs helped facilitate the postponement of marriage and childbearing, while promoting higher female educational and professional achievements.[2,3] In Saudi Arabia, similar trends have been observed, with contraceptive use increasing markedly from 23.8% in 2007 to 53.4% in 2015.[4]

Family planning programmes have proven effective in managing fertility, especially in developing countries, where contraceptive use is a key determinant in lowering fertility rates.[5] These programmes also yield additional benefits, such as poverty reduction, improved healthcare access, and enhanced autonomy and wellbeing for women and families. The US Department of Health and Human Services has highlighted these broader health and socioeconomic advantages as part of a comprehensive reproductive health strategy.[6,7]

Saudi Arabia, like other countries undergoing rapid social and economic transformation, is experiencing shifting reproductive norms influenced by urbanisation, delayed marriage, increased female education, and greater access to healthcare.[8] Notably, recent national statistics indicate a steady decline in the country's total fertility rate — from >7 children per woman in the 1980s to below the replacement level of 2.1 in recent years — raising concerns about long-

[1]Department of Obstetrics and Gynaecology, College of Medicine, King Saud University, Riyadh, Saudi Arabia; [2-5]5th Year MBBS Student, College of Medicine, King Saud University, Riyadh, Saudi Arabia.

Correspondence: Lateefa Othman Aldakhil. e-mail: lateefa95@hotmail.com
ORCID ID: 0000-0001-8339-7469

Submission complete: 05-11-2024 **1st Revision received:** 11-03-2025
Acceptance: 17-12-2025 **Last Revision received:** 20-01-2026

term demographic balance, workforce sustainability, and the socioeconomic implications of an ageing population.[9,10] This demographic shift underscores the urgency of understanding the factors driving fertility change in the Saudi context. Documented evidence shows evolving patterns in high-risk pregnancies, with maternal age and parity as significant determinants.[11] Studies in Saudi Arabia have indicated that attitudes towards preconception care and family planning are strongly shaped by cultural norms,[12] and that awareness, knowledge and use of family planning methods vary considerably across regions and occupational groups.[13,14] These findings highlight the need for tailored public health strategies that address both knowledge gaps and sociocultural barriers to effective reproductive health planning, while emphasizing the importance of localised data to guide policy development within the Saudi sociocultural context. The current study was planned to quantify fertility patterns in terms of age, parity and reproductive outcomes among married women, to evaluate the association between early marriage and higher parity, and to identify lifestyle and medical factors influencing reproductive patterns in Saudi Arabia.

Subjects and Methods

The cross-sectional study was conducted between September 2021 and August 2022 in Saudi Arabia. Data were collected from married or previously married women attending five major tertiary hospitals representing the principal regions of Saudi Arabia: King Khalid University Hospital, Riyadh (Central region); King Fahad Specialist Hospital, Dammam (Eastern region); Arar Central Hospital (Northern region); Asir Central Hospital, Abha (Southern region); and Maternity & Children Hospital, Makkah, and with King Abdulaziz University Hospital, Jeddah (Western region)

After obtaining institutional ethics approval, the sample size was calculated using Cochran's formula for single-proportion estimation (Cochran, 1977)[15] with a 95% confidence level (Z=1.96), an assumed prevalence (p) of 50%—commonly used when population prevalence is unknown to yield the maximum required sample size—and a margin of error (e) of 5%. The calculated sample was then increased by 20% to compensate for potential non-response or incomplete questionnaires.

A systematic sampling technique was applied. In each hospital, every third eligible woman presenting during the study period was invited to participate, ensuring equal probability of selection and minimizing selection bias. Inclusion criteria were defined as married or previously married women, regardless of parity.

Data were collected using a structured, pre-tested questionnaire that captured demographic characteristics, reproductive history, fertility intentions, and family planning behaviours. The questionnaire was developed following WHO core reproductive health indicators and informed by domains used in previously validated reproductive health surveys.[16-18] Content validity was evaluated by experts in obstetrics, gynecology, and public health. The tool underwent pilot testing to ensure clarity, cultural appropriateness, and internal consistency, and necessary revisions were made based on feedback.

Trained data collectors conducted standardized face-to-face interviews after receiving instruction on study protocols and ethical principles. Written informed consent was obtained from all participants. To ensure data integrity, regular quality checks were performed, including supervisor review, double data entry for a subset of questionnaires, and reconciliation of inconsistencies.

Data analysis was performed using SPSS version 23. Descriptive statistics summarised demographic and clinical characteristics. Bivariate analyses used chi-square tests, *t*-tests, analysis of variance (ANOVA), and Pearson correlation to explore associations between parity and predictor variables. Variables with $p<0.05$ were entered into a multivariable linear regression model to identify independent predictors of parity. Missing data were handled using appropriate imputation strategies, and sensitivity analyses were performed where necessary.

Results

A total of 2488 married or previously married women from across Saudi Arabia were included in the study (Table 1). The Western region contributed the largest proportion of participants (1090/2488; 43.8%), followed by the Central region (757/2488; 30.4%), while the Southern (314/2488; 12.6%), Eastern (190/2488; 7.6%), and Northern regions (137/2488; 5.5%) contributed smaller proportions (Table 1). More than one-third of the women were aged >40 years (878/2488; 35.3%), and 804/2488 (32.3%) were aged 31–40 years. Most women married between 22–30 years (1199/2488; 48.2%), and 837/2488 (33.6%) married between 18–21 years. A similar pattern was observed for age at first childbirth, with 1281/2488 (51.5%) having their first child between 22–30 years, while 219/2488 (8.8%) had not yet had a child (Table 1).

Educational attainment was generally high, with 1600/2488 (64.3%) reporting university education and 243/2488 (9.8%) holding postgraduate degrees. Employment rates were extremely low (2485/2488; 99.9% unemployed). Family income varied, although the largest group earned 10,000–20,000 SAR/month (1072/2488; 43.1%). Cigarette

smoking was reported by 140/2488 (5.6%) (Table 1).

Table 1: Socio-demographic, reproductive, and health characteristics of married or previously married women in Saudi Arabia (n=2488).

	n (%)
Region	
Central	757 (30.4)
Eastern	190 (7.6)
Northern	137 (5.5)
Southern	314 (12.6)
Western	1090 (43.8)
Age groups (years)	
<18	44 (1.8)
18 – 21	119 (4.8)
22 – 30	643 (25.8)
31 – 40	804 (32.3)
>40	878 (35.3)
Age of marriage (years)	
<18	332 (13.3)
18 – 21	837 (33.6)
22 – 30	1199 (48.2)
31 – 40	108 (4.3)
>40	12 (0.5)
Age when they had first child (years)	
No child yet	219 (8.8)
<18	139 (5.6)
18-21	669 (26.9)
22-30	1281 (51.5)
31-40	174 (7.0)
>40	6 (0.2)
Educational level	
High school or less	645 (25.9)
University	1600 (64.3)
Higher degree	243 (9.8)
Employment	
No	2485 (99.9)
Yes (all government employees)	3 (0.1)
Family income (Pak Rupee)	
<10000	764 (30.7)
10000 – 20000	1072 (43.1)
21000 – 30000	402 (16.2)
>30000	250 (10.0)
Smoking	
No	2348 (94.4)
Yes	140 (5.6)
How many times got pregnant	
Never	351 (14.1)
1 – 3 x	1035 (41.6)
4 – 6 x	773 (31.1)
>6 x	329 (13.2)
How many times gave birth (parity)	
Never	275 (11.1)
– 3	1198 (48.2)
4– 6 x	840 (33.8)
>6 x	175 (7.0)

Continued on next column.....

Table 1: *Continued from previous column.*

	n (%)
Had miscarriage	
No	1456 (58.5)
Yes	1032 (41.5)
Number of miscarriages	
Never	1451 (58.3)
1 – 3x	959 (38.5)
4 – 6x	66 (2.7)
>6x	-
I do not know	12 (0.5)
Number of times CS	
Never	1584 (63.7)
1 – 3 x	777 (31.2)
4 – 6 x	118 (4.7)
>6 x	9 (0.4)
Number of times NSV	
Never	671 (27.0)
1 – 3x	1012 (40.7)
4 – 6x	682 (27.4)
>6x	123 (4.9)
Number of AVD	
Never	1824 (73.3)
1 – 3x	342 (13.7)
4 – 6x	55 (2.2)
>6x	267 (10.7)
Have chronic disease	
No	1756 (70.6)
Yes	732 (29.4)
Chronic diseases present	
Thyroid disease	253 (10.2)
Asthma	247 (9.9)
Hypertension	212 (8.5)
Diabetes Mellitus	193 (7.8)
Bipolar disease	72 (2.9)
Depression	72 (2.9)
Schizophrenia	71 (2.9)
Heart disease	40 (1.6)
Did any of the chronic disease prevent you from having children?	
No	533 (21.4)
Yes	85 (3.4)
Maybe	114 (4.6)
Had surgeries other than CS	
No	1732 (69.6)
Yes	756 (30.4)
Use contraception	
No	885 (35.6)
Yes	1603 (64.4)
Contraception methods	
Oral contraceptive pills	796 (32.0)
IUD	430 (17.3)
Condom	361 (14.5)
Patch	104 (4.2)
	63 (2.5)
Implant	44 (1.8)
Injections	31 (1.2)
Caps / diaphragms	1 (0.04)

Continued on next page.....

Table 1: *Continued from previous page.*

	n (%)
Vaginal rings	1 (0.04)
Withdrawal	
Planned to have specific number of children before/after marriage	
No	
Yes	1482 (59.6)
Maybe	936 (37.6)
	70 (2.8)
If yes, how many children?	
1-3	451 (18.1)
4-6	480 (19.3)
>6	62 (2.5)
Reasons for planning or not planning the number of children?	
Cultural tradition	225 (9.0)
Gender preference	113 (4.5)
Husband's desire	309 (12.4)
Wife's desire	596 (24.0)
Religion	466 (18.7)
Ohers	779 (31.3)

AVD: Assisted vaginal delivery, NSV: Normal Spontaneous Vaginal delivery, CS: Caesarean section, IUD: Intra-Uterine Device

Reproductive history indicated that 1035/2488 (41.6%) women had been pregnant 1–3 times, 773/2488 (31.1%) 4–6 times, and 329/2488 (13.2%) more than six times. Parity followed a similar distribution, with 1198/2488 (48.2%) having 1–3 births, 840/2488 (33.8%) having 4–6 births, 175/2488 (7.0%) having more than six births, and 275/2488 (11.1%) being nulliparous. Miscarriage was common, reported by 1032/2488 (41.5%), predominantly 1–3 events (959/2488; 38.5%) (Table 1). Caesarean delivery had been performed in 904/2488 (36.3%), while 1012/2488 (40.7%) had undergone 1–3 normal spontaneous vaginal deliveries and 342/2488 (13.7%) 1–3 assisted vaginal deliveries (Table 1).

Chronic diseases were reported by 732/2488 (29.4%), most commonly thyroid disease (253/2488; 10.2%) and asthma (247/2488; 9.9%). A minority reported that chronic disease affected fertility (85/2488; 3.4%), while 114/2488 (4.6%) were uncertain. Surgeries other than caesarean section had been performed in 756/2488 (30.4%) (Table 1).

Contraception use was widespread, with 1603/2488 (64.4%) reporting use of at least one method most commonly oral contraceptive pills (796/2488; 32.0%) and intrauterine devices (430/2488; 17.3%). Family planning practices varied: 1482/2488 (59.6%) had not planned the number of children, 936/2488 (37.6%) had planned their family size, and 70/2488 (2.8%) were undecided (Table 1).

Analysis of parity revealed significant associations with key sociodemographic and reproductive variables (Table 2). Higher parity was associated with younger age at marriage and younger age at first childbirth ($p<0.001$). Lower educational attainment was also significantly associated with higher parity ($p<0.001$), while correlation analysis demonstrated a modest negative correlation between parity and education ($r=-0.115$; $p<0.001$) (Table 3). Family income showed a small but significant positive correlation with parity ($r=0.103$; $p<0.001$) (Table 3). Parity was also positively correlated with the number of pregnancies ($r=0.765$; $p<0.001$), caesarean deliveries ($r=0.221$; $p<0.001$), normal spontaneous vaginal deliveries ($r=0.748$; $p<0.001$), and assisted vaginal deliveries ($r=0.111$; $p<0.001$) (Table 3). Negative correlations were observed for smoking ($r=-0.083$; $p<0.001$) and education ($r=-0.115$; $p<0.001$) (Table 3).

Table 2: Distribution of parity across socio-demographic, reproductive, and lifestyle characteristics among women in Saudi Arabia (n=2488).

Variables	Parity				*p*-values
	Never	1-3	4-6	>6	
	n (%)	n (%)	n (%)	n (%)	
Region					
Central	84 (30.5)	345 (28.8)	268 (31.9)	66 (34.3)	0.167
Eastern	26 (9.5)	96 (8.0)	58 (6.9)	10 (5.7)	
Northern	16 (5.8)	60 (5.0)	54 (6.4)	7 (4.0)	
Southern	35 (12.7)	161 (13.4)	88 (10.5)	30 (17.1)	
Western	114 (41.5)	536 (44.7)	372 (44.3)	68 (38.9)	
Age groups (years)					
<18	24 (8.7)	18 (1.5)	2 (0.2)	0	<0.001
18 – 21	43 (15.6)	64 (5.3)	9 (1.1)	3 (1.7)	
22 – 30	135 (49.1)	455 (38.0)	41 (4.9)	12 (6.9)	
31 – 40	46 (16.7)	470 (39.2)	266 (31.7)	22 (12.6)	
>40	27 (9.8)	191 (15.9)	522 (62.1)	138 (78.9)	
Age of marriage (years)					
<18	25 (9.1)	103 (8.6)	144 (17.1)	66 (34.3)	<0.001
18 – 21	71 (25.8)	381 (31.8)	312 (37.1)	73 (41.7)	
22 – 30	150 (54.5)	648 (54.1)	365 (43.5)	36 (20.6)	
31 – 40	23 (8.4)	66 (5.5)	16 (1.9)	3 (1.7)	
>40	6 (2.2)	0	3 (0.4)	3 (1.7)	
Age when they had first child (years)					
No child yet	211 (76.7)	6 (0.5)	2 (0.2)	0	
<18	5 (1.8)	41 (3.4)	50 (6.0)	43 (24.6)	
18-21	16 (5.8)	283 (23.6)	298 (35.5)	72 (41.1)	<0.001
22-30	36 (13.1)	727 (60.7)	462 (55.0)	56 (32.0)	
31-40	7 (2.5)	137 (11.4)	27 (3.2)	3 (1.7)	
>40	0	4 (0.3)	1 (0.1)	1 (0.6)	
Educational level					
High school or less	65 (23.6)	246 (20.5)	238 (28.3)	96 (54.9)	<0.001
University	189 (68.7)	825 (68.9)	523 (62.3)	63 (36.0)	
Higher degree	21 (7.6)	127 (10.6)	79 (9.4)	16 (9.1)	
Employment					
No	273 (99.3)	1198 (100)	839 (99.9)	175 (100)	0.018
Yes (all government employees)	2 (0.7)		1 (0.1)	0	
Family income (Pak Rupee)					
<10000	107 (38.9)	429 (35.8)	180 (21.4)	48 (27.4)	<0.001
10000 – 20000	104 (37.8)	498 (41.6)	387 (46.1)	83 (47.4)	
21000 – 30000	30 (10.9)	175 (14.6)	173 (20.6)	24 (13.7)	
>30000	34 (12.4)	96 (8.0)	100 (11.9)	20 (11.4)	
Smoking					
No	245 (89.1)	1127 (94.1)	807 (96.1)	169 (96.6)	<0.001
Yes	30 (10.9)	71 (5.9)	33 (3.9)	6 (3.4)	

Continued on next page.....

Table 2: *Continued from previous page.*

Variables	Parity				*p*-values
	Never	1-3	4-6	>6	
	n (%)	n (%)	n (%)	n (%)	
How many times got pregnant					
Never	241 (87.6)	67 (5.6)	33 (3.9)	10 (5.7)	
1 – 3 x	31 (11.3)	942 (78.6)	48 (5.7)	14 (8.0)	<0.001
4 – 6 x	2 (0.7)	173 (14.4)	593 (70.6)	5 (2.9)	
>6 x	1 (0.4)	16 (1.3)	166 (19.8)	146 (83.4)	
Had miscarriage					
No	232 (84.4)	789 (65.9)	374 (44.5)	81 (34.9)	<0.001
Yes	43 (16.6)	409 (34.1)	466 (55.5)	114 (65.1)	
Number of times miscarriage					
Never	230 (83.6)	784 (65.4)	377 (44.9)	60 (34.3)	<0.001
1 – 3x	38 (13.8)	380 (31.7)	437 (52.0)	104 (59.4)	
4 – 6x	5 (1.8)	31 (2.6)	23 (2.7)	7 (4.0)	
>6x	2 (0.7)	3 (0.3)	3 (0.4)	4 (2.3)	
Number of times CS					
Never	266 (96.7)	720 (60.1)	496 (59.0)	102 (58.3)	<0.001
1 – 3 x	8 (2.9)	456 (38.1)	265 (31.5)	48 (27.4)	
4 – 6 x	1 (0.4)	20 (1.7)	79 (9.4)	18 (10.3)	
>6 x	0	2 (0.2)	0	7 (4.0)	
Number of times NSV					
Never	267 (97.1)	320 (26.7)	78 (9.3)	6 (3.4)	
1 – 3x	5 (1.8)	837 (69.9)	154 (18.3)	16 (9.1)	<0.001
4 – 6x	3 (1.1)	39 (3.3)	597 (71.1)	43 (24.6)	
I do not know	0	2 (0.2)	11 (1.3)	110 (62.9)	
Number of times AVD					
Never	250 (90.9)	887 (74.0)	592 (70.5)	95 (54.3)	<0.001
1 – 3x	4 (1.5)	167 (13.9)	128 (15.2)	43 (24.6)	
4 – 6x	3 (1.1)	8 (0.7)	35 (4.2)	9 (5.1)	
>6x	18 (6.5)	136 (11.4)	85 (10.1)	28 (16.0)	
Did any of the chronic disease prevent you from having children?					<0.001
No	194 (70.5)	920 (76.8)	545 (64.9)	97 (55.4)	
Yes	81 (29.5)	278 (23.2)	295 (35.1)	78 (44.6)	
Had surgeries other than CS					
No	216 (78.5)	892 (74.5)	532 (63.3)	92 (52.6)	<0.001
Yes	59 (21.5)	306 (25.5)	308 (36.7)	83 (47.4)	
Use contraception					
No	154 (56.0)	411 (34.3)	253 (30.1)	67 (38.3)	<0.001
Yes	121 (44.0)	787 (65.7)	587 (69.9)	108 (61.7)	
Planned to have specific number of children before/after marriage					<0.001
No	124 (45.1)	619 (51.7)	594 (70.7)	145 (82.9)	
Yes	144 (52.4)	553 (46.2)	211 (25.1)	28 (16.0)	
Maybe	7 (2.5)	26 (2.2)	35 (4.2)	2 (1.1)	
Reasons for planning or not planning the number of children?					<0.001
Cultural tradition	13 (4.7)	92 (7.7)	90 (10.7)	30 (17.1)	
Gender preference	20 (7.3)	46 (3.8)	43 (5.1)	4 (2.3)	
Husband's desire	47 (17.1)	132 (11.0)	104 (12.4)	26 (14.9)	
Wife's desire	86 (31.3)	337 (28.1)	160 (19.0)	13 (7.4)	
Religion	32 (11.6)	193 (16.1)	188 (22.4)	53 (30.3)	
Others	77 (28.0)	398 (33.2)	255 (30.4)	49 (28.0)	

AVD: Assisted vaginal delivery, NSV: Normal Spontaneous Vaginal delivery, CS: Caesarean section.

Contraception use showed a significant association with parity (p<0.001), with women of higher parity more likely to report contraceptive use. Planning for family size was also significantly associated with parity (p<0.001), with unplanned pregnancies reported more frequently among women with higher parity (Table 2).

Among women aged >40 years (878 participants), those with high parity (≥4 births) were significantly more likely to

Table-3: Correlation of parity with socio-demographic, reproductive and family planning variables among married women (n=2488).

	Correlation coefficient	*p*-value
Region	-0.015	0.462
Age groups (years)	0.539	<0.001
Age when they had first child (years)	0.252	<0.001
Educational level	-0.115	<0.001
Employment	-0.032	0.115
Family income (Pak Rupee)	0.103	<0.001
Smoking	-0.083	<0.001
How many times got pregnant	0.765	<0.001
Had miscarriage	0.287	<0.001
Number of times miscarriage	0.226	<0.001
Number of times CS	0.221	<0.001
Number of times NSV	0.748	<0.001
Number of times AVD	0.111	<0.001
Have chronic disease	0.111	<0.001
Did any of the chronic disease prevent you from having children?	-0.056	0.131
Had surgeries other than CS	0.155	<0.001
Use contraception	0.101	<0.001
Planned to have specific number of children before/after marriage	-0.198	<0.001
Number of children planned	0.348	<0.001
Reasons for planning or not planning the number of children?	-0.022	0.263

AVD: Assisted vaginal delivery, NSV: Normal Spontaneous Vaginal delivery, CS: Caesarean section.

Table-4: Comparison of socio-demographic, reproductive and family planning characteristics in women aged >40 years with respect to parity category (<4 vs ≥4).

Variables	Age > 40 years		*p*-value
	Parity <4	Parity ≥4	
	n=218	n= 660	
	n(%)	n(%)	
Region			
Central	68 (23.1)	227 (76.9)	
Eastern	3 (10.7)	25 (89.3)	0.069
Northern	7 (18.9)	30 (81.1)	
Southern	16 (19.3)	67 (80.7)	
Western	124 (28.5)	311 (71.5)	
Age of marriage (years)			<0.0001
<18	24 (11.0)	133 (20.2)	
18 – 21	51 (23.4)	247 (37.4)	
22 – 30	101 (46.3)	266 (40.3)	
31 – 40	37 (17.0)	11 (1.7)	
>40	5 (2.3)	3 (0.5)	
Age when they had first child (years)			<0.0001
No child yet	23 (10.6)	0	
<18	8 (3.7)	67 (10.2)	
18-21	30 (13.8)	223 (33.8)	
22-30	104 (47.7)	346 (52.4)	
31-40	50 (22.9)	24 (3.6)	
>40	3 (1.4)	0	
Educational level			0.001
High school or less	46 (21.1)	219 (33.2)	
University	152 (69.7)	409 (62.0)	
Higher degree	20 (9.2)	32 (4.8)	
Employment			
No	218 (100)	659 (99.8)	0.565
Yes (all government employees)	0	1 (0.2)	

Continued on next page.....

Table-4: *Continued from previous page.*

Variables	Age > 40 years		*p*-value
	Parity <4	Parity ≥4	
	n=218	n= 660	
	n(%)	n(%)	
Family income (Pak Rupee)			
<10000	51 (23.4)	137 (20.8)	0.596
10000 – 20000	103 (47.2)	305 (46.2)	
21000 – 30000	36 (16.5)	135 (20.5)	
>30000	28 (12.8)	83 (12.6)	
Smoking			0.011
No	205 (94.0)	644 (97.6)	
Yes	13 (6.0)	16 (2.4)	
Had miscarriage			<0.0001
No	119 (54.6)	268 (40.6)	
Yes	99 (45.4)	392 (59.4)	
Number of times CS			<0.001
Never	121 (55.5)	405 (61.4)	
1 – 3 x	96 (44.0)	184 (27.9)	
4 – 6 x	1 (0.5)	66 (10.0)	
>6 x	0	5 (0.8)	
Number of times NSV			<0.001
Never	87 (39.9)	44 (6.7)	
1 – 3x	125 (57.3)	86 (13.0)	
4 – 6x	5 (2.3)	432 (65.5)	
I do not know	1 (0.5)	98 (14.8)	
Number of times AVD			0.293
Never	160 (73.4)	458 (69.4)	
1 – 3x	33 (15.1)	113 (17.1)	
4 – 6x	1 (0.5)	15 (2.3)	
>6x	24 (11.0)	74 (11.2)	
Did any of the chronic diseases prevent you from having children?			0.150
No	64 (74.4)	205 (82.0)	
Yes	8 (9.3)	23 (9.2)	
Maybe	14 (16.3)	22 (8.8)	
Had surgeries other than CS			0.771
No	125 (57.3)	371 (56.2)	
Yes	93 (42.7)	269 (43.8)	
Use contraception			<0.0001
No	118 (54.1)	217 (32.9)	
Yes	100 (45.9)	442 (67.1)	
Planned to have specific number of children before/after marriage			0.085
No	152 (69.7)	502 (76.1)	
Yes	64 (29.4)	147 (22.3)	
Maybe	2 (0.9)	11 (1.7)	
Reasons for planning or not planning the number of children?			0.034
Cultural tradition	14 (6.4%)	71 (10.8)	
Gender preference	5 (2.3%)	24 (3.6)	
Husband's desire	19 (8.7%)	67 (10.2)	
Wife's desire	45 (20.6%)	112 (17.0)	
Religion	44 (20.2%)	172 (26.1)	
Others	91 (41.7%)	214 (32.4)	

AVD: Assisted vaginal delivery, NSV: Normal Spontaneous Vaginal delivery, CS: Caesarean section.

have married before age 22 (p<0.0001), had their first child before age 22 (p<0.0001), had lower education (p=0.001), and used contraception (p<0.0001) compared with women of lower parity (Table 4).

Table-5: Multivariable linear regression analysis of factors independently associated with parity among married women (n=2488).

	B	95%CI	*p*-values
Region	-0.012	-0.025,0.001	0.081
Age when they had first child	-0.082	-0.115, -0.048	<0.0001
Educational level	-0.035	-0.083, 0.013	0.157
Employment	-0.458	-1.147, 0.231	0.192
Family income	0.039	0.012, 0.066	0.005
Smoking	-0.160	-0.291, -0.030	0.016
Number of times CS	0.394	0.364, 0.424	<0.0001
Number of times NSV	0.577	0.552, 0.603	<0.0001
Number of times AVD	-0.010	-0.028, 0.008	0.275
Have chronic disease	0.007	-0.042, 0.055	0.789
Use contraception	0.071	0.023, 0.120	0.004

AVD: Assisted vaginal delivery, NSV: Normal Spontaneous Vaginal delivery, CS: Caesarean section, CI: Confidence interval.

Multivariable regression identified several independent predictors of higher parity (Table 5). These included younger age at first childbirth (β=–0.082; p<0.0001), higher number of normal spontaneous vaginal deliveries (β=0.577; p<0.0001), higher family income (β=0.039; p=0.005), history of caesarean delivery (β=0.394; p<0.0001), and smoking (β = –0.160; p=0.016).

Discussion

The current study provides important insights into the socio-demographic, cultural and economic factors influencing fertility patterns among married women in Saudi Arabia. The findings highlight that early marriage and lower educational attainment are significantly associated with higher parity, consistent with reports from other Middle Eastern and South Asian contexts.[19,20]

In the present cohort, higher educational attainment was inversely associated with parity, although the effect size was modest. This aligns with global and regional evidence showing that education delays marriage, reduces fertility, and increases women's workforce participation.[20,21]

Lifestyle and health factors, such as smoking and mode of delivery, also influenced parity. While smoking had a negative association with parity, multiple CS and sterilisation procedures were positively correlated, suggesting that higher parity may increase the likelihood of medical interventions. These findings echo data from international obstetric studies where multiparity is linked to greater cumulative obstetric morbidity and surgical deliveries.[22,23]

Importantly, contraceptive use in the current study was more common among women with higher parity, supporting the interpretation that family planning adoption often follows rather than precedes achieving the desired family size. This pattern has also been observed in similar sociocultural contexts where contraception is

frequently framed as a method for birth spacing or limiting rather than delaying the onset of childbearing.[24,25]

The current findings parallel global fertility transitions where economic development, increased educational attainment, and improved access to healthcare contribute to declining fertility. In high-income countries, fertility decline has often preceded widespread contraceptive adoption, whereas in low- and middle-income countries (LMICs), contraceptive use is both a driver and a consequence of changing fertility norms. Comparisons with recent data from Qatar, Oman and the United Arab Emirates (UAE) show similar trends of delayed marriage and reduced parity, underscoring the regional nature of these demographic shifts.[24-27] The current study's strengths include its large, multi-regional sample, validated tool, and robust statistical analysis. However, there are limitations as well. The cross-sectional design limited causal inference, and sampling from tertiary hospitals may have reduced generalisability of the findings to rural or underserved populations. Self-reported data may have introduced recall and social desirability bias, particularly for sensitive topics like contraceptive use. Some influential factors, such as partner's education and healthcare access, were not assessed, leading to possible residual confounding. Additionally, several associations, while statistically significant, had small effect sizes, limiting their practical impact. Future research should adopt longitudinal and mixed-methods designs to explore more diverse demographic groups, and examine partner- and community-level influences on reproductive decisions.

Conclusion

Early marriage, lower educational attainment, and limited contraceptive use were found linked to higher parity, while delayed childbearing and higher education correlated with smaller family size. Medical factors, including CS and sterilisation, also showed significant associations with parity.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

References

1. Oser M. Fertility rate – Our World in Data. [Online] 2023 [Cited 2025 February 05]. Available from URL: https://ourworldindata.org/fertility-rate#definitions-of-fertility-measures
2. Goldin C, Katz LF. The power of the pill: Oral contraceptives and women's career and marriage decisions. J Polit Econ 2002;110:730-70. doi: 10.1086/340778
3. Bastawesy ME, Harbi KA, Habeebullah T, Abdelkarim A, Gaber AFD, Shwehdi MH, et al. Demographic survey 2022. J Geogr Inf Syst 2022;10:1-9.
4. Al-Khathami AA, Alshammari AA, Aldawsari SA, Alsaawi AA, Alanazi SM, Alrashidi MS, et al. Contemporary fertility trends in Saudi Arabia: Analysis of national demographic data. Saudi Med J 2021;42:600-07. doi: 10.15537/smj.2021.42.6.20210088
5. Omo-Aghoja L. Sexual and reproductive health among sub-Saharan African women: A review of recent trends. Afr J Reprod Health 2021;25:22-31.
6. Cleland J, Bernstein S, Ezeh A, Faundes A, Glasier A, Innis J. Family planning: The unfinished agenda. Lancet 2020;396:273-83. doi: 10.1016/S0140-6736(20)30917-5
7. Butler ASW. Overview of family planning in the United States: A review of the HHS Family Planning Program. Washington, DC: National Academies Press; 2021.
8. Fahimi FR, Monem AA, Ashford L, El-Adawy M. Women's need for family planning in Arab countries: A contemporary review. New York, NY: UNFPA; 2021.
9. Saudi Arabian Monetary Authority. Population aging in Saudi Arabia. Riyadh, Saudi Arabia: SAMA; 2019.
10. Macrotrends. Saudi Arabia fertility rate 1950–2025. [Online] 2024 [Cited 2026 February 27]. Available from URL: https://www.macrotrends.net/
11. Hafez SK, Sayed SAM. Profile of high-risk pregnancy among Saudi women: Recent trends and determinants. Saudi Med J 2022;43:280-7. doi: 10.15537/smj.2022.43.3.20210798
12. Parveen N. Attitudes of Saudi women toward preconception care and family planning in the Hail region. J Fam Plann Reprod Health Care 2022;48:123-9.
13. Alenezi GG, Haridi HK. Awareness and use of family planning methods among women in northern Saudi Arabia. Middle East Fertil Soc J 2021;26:20. doi: 10.1186/s43043-021-00066-3
14. Alharbi MM, Alharbi MS, Alnazzawi A, Albasri R, Al Towairqi M, Shaikh S, et al. Knowledge, attitudes, and practices regarding family planning among female teachers in Al-Madinah, Saudi Arabia. Int J Acad Sci Res 2021;9:82-92.
15. Cochran WG. Sampling techniques, 3rd ed. New York, NY: John Wiley & Sons; 1977.
16. World Health Organization (WHO). Reproductive health indicators: Guidelines for their generation, interpretation and analysis for global monitoring. Geneva, Switzerland: World Health Organization; 2006.
17. Centers for Disease Control and Prevention (CDC). Reproductive health survey toolkit for population-based surveys. Atlanta, GA: U.S. Department of Health and Human Services; 2011.
18. ICF International. Demographic and Health Survey (DHS) Model Woman's Questionnaire. Calverton, MD: ICF International; 2012.
19. Solanke BL. Maternal socio-demographic factors associated with low parity and grand multiparity in Nigeria. Women Health 2021;59:730-47. doi: 10.1080/03630242.2019.1685517
20. Akram R, Sarker AR, Sheikh N, Ali N, Mozumder MGN, Sultana M. Factors associated with unmet fertility desire and ideal family size among women in Bangladesh. PLoS One 2020;15:e0233262. doi: 10.1371/journal.pone.0233262
21. Al-Mandhari A, Al-Ghammari I, Al-Kindi R, Al-Lawati N, Al-Farsi Y, Al-Rawahi A, et al. Determinants of fertility and family planning in Oman: Results from the Oman National Health Survey 2021. East Mediterr Health J 2022;28:377-85. doi: 10.26719/emhj.22.050
22. Babinszki A, Kerenyi T, Torok O, Ben-Ami M, Perelman K, Herman A. Perinatal outcome in grand and great-grand multiparity: Effects of parity on obstetric risk factors. Am J Obstet Gynecol 1999;181:669-74. doi: 10.1016/S0002-9378(99)70502-7
23. Adane AA, Ayele TA, Ararsa LG, Bitew BD, Zeleke BM. Adverse birth outcomes among deliveries at a referral hospital in Ethiopia. BMC Pregnancy Childbirth 2020;20:114. doi: 10.1186/s12884-020-2807-3

24. Badr HE, Al-Rashidi RM, Al-Jarallah RS. Fertility preferences and contraceptive use among women in Qatar. BMC Womens Health 2021;21:231. doi: 10.1186/s12905-021-01370-2
25. Alwabari AA, AlGhannam KA, Aljassim MJ, Bograin KI, Alturaifi MR. Knowledge, attitude, and practice of family planning among Saudi primary health care attendees in Al-Ahsa. Cureus 2023;15:e40551. doi: 10.7759/cureus.40551
26. Ashoor R, Alrashid S, Alruhaimi S, Alanazi S, Alzahrani H, Alshammari YS, et al. Awareness of contraceptives among Saudi women in Riyadh. Cureus 2023;15:e48820. doi: 10.7759/cureus.48820
27. United Nations, Department of Economic and Social Affairs (DESA). World fertility and family planning 2022: Highlights. New York, NY: United Nations; 2022.

Author Contribution:
LOA: Concept, revision, final approval and supervision.
GSA: Concept, data acquisition, analysis, investigation, drafting, revision and final approval.
MFA: Data acquisition, analysis, investigation, drafting, revision and final approval.
LKA: Data acquisition, analysis, drafting, revision and final approval.
BFA: Data analysis, revision and final approval.