

DETERMINANTS OF BIRTH SPACING AMONG SAUDI WOMEN

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مقدمة: مستويات الخصوبة العالية تعتبر من الاهتمامات الرئيسية إلى المخططين وصنّاع السياسة في أكثر البلدان في العالم النامي. في المملكة العربية السعودية معدل نمو السكان يعد ثالث أعلى معدل بين بلدان منطقة شرقي البحر الأبيض المتوسط

هدف الدراسة: هذه الدراسة استهدفت تمييز أمرين هما مباحدة الأحمال ومعرفة موقف النساء السعوديات نحو مفهوم تحديد النسل.

طريقة الدراسة: تم إجراء مسح مقطعي، لكل النساء المتزوجات بعمر 15-49 سنة المترددات على مستشفى الهدا للقوات المسلحة (رعاية صحية أساسية وعيادات عناية قبل الولادة)، البيانات جمعت من قبل الأطباء وممرضات العناية الأساسية المُتدرّبين بين أول فبراير/شباط 2005 حتى الحادي والثلاثين من يناير/كانون الثاني 2006.

النتائج: تضمنت الدراسة 786 امرأة متزوجة، المدة المتوسطة لفترة بين الأحمال كانت 2.38 ± 1.24 سنة. كشف تحليل انحدار كوكس أن التعليم العالي للمرأة، عمل المرأة، عمل الزوج تأريخ إصابة المرأة بالأمراض المزمنة، تشجيع الزوج بفكرة تباعد الأحمال كانت لها دلالة استشرافية معنوية لطول فترة تباعد الأحمال أما قصر فترة تباعد الأحمال فإنها ترتبط بالدخل العائلي الأدنى، ووجود الإناث فقط أو ذكور وإناث متساوين في الأسرة مقابل وجود الذكور الأكثر. الغالبية العظمى من النساء المشاركات (98%) كان عندهن رأي إيجابي بخصوص تأثير مباحدة الأحمال على المستوى العائلي.

الخلاصة: أظهرت هذه الدراسة أن بعض العوامل كانت لها دلالة معنوية في تحديد تباعد الأحمال للنساء السعوديات المشاركات في الدراسة وهذه يمكن أن تؤدي إلى الإصلاحات التي تشجع الفترات الأطول بين الولادات المتتالية. على أية حال الموضوع يحتاج إلى دراسات أخرى للتحقيق في وجود علاقة سببية.

الكلمات المرجعية: النساء السعوديات، مباحدة الأحمال

Background: High fertility levels are of major concern to planners and policy makers in most countries in the developing world. In Saudi Arabia, the rate of population growth is the third highest of the countries of the Eastern Mediterranean Region.

Objectives: This study aimed at identifying determinants of birth spacing and attitudes toward family planning among Saudi women.

Methods: A cross sectional survey of all women who have been married before, aged 15-49 years attending Al Hada armed forces hospital (primary health care and antenatal care clinics), was conducted between 1st February 2005 and 31st January 2006. Data was collected on socio-demographic, biological characteristics, beliefs, attitudes, and utilization of family planning services, pregnancy intervals and medical history

Results: For the 786 women included in the study, the mean duration of interbirth interval was 2.38 ± 1.24 years. The multivariate Cox regression revealed that a woman's education, work status, husband's work status, a woman's history of chronic diseases, and husband's encouragement of interbirth spacing were the only significant predictors of longer interbirth intervals. Shorter interbirth intervals were independently predicted by lower family income, and presence of female offspring only or equal number of male and female offspring as opposed to presence of more males. The great majority of participating women (98%) had a positive opinion of the effect of birth spacing on the family.

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Conclusion: *This study showed that certain factors were significant predictors of interbirth spacing for the Saudi women. This should lead to the encouragement of longer intervals between births. However, further studies are needed to ascertain a cause-effect association.*

Keywords: Saudi, Women, Birth spacing

INTRODUCTION

The concept of reproductive health is relatively new, but has gained momentum since mid-1990s. While it mainly addresses issues on reproduction for both men and women, it also deals with women's health issues as a whole, since these issues are closely related to the reproductive process.¹ As women play an important role in caring for family members, especially children, their illness or deaths has an immediate effect on the well being of the family as a whole, and may impact the entire population.²

High fertility levels are of major concern to planners and policy makers in most countries in the developing world. In Saudi Arabia, the rate of population growth is 4.3%, the third highest among countries of the Eastern Mediterranean Region.³ The analysis of birth intervals is of interest in this context since it can provide further insight into the mechanisms underlying changes in fertility.⁴ Short birth intervals adversely affect the health of mothers and the survival of their children. The risk of the death of a child increases if the interval between the birth of the child and the previous birth is less than 24 months.⁵⁻⁶ The regulation of fertility is found to be an essential factor for improving maternal health and the nutritional status of child and the reduction of child mortality rate.^{1,2,5-7}

Pregnancies that occur too early or too late in a woman's reproductive life, those that are too closely spaced, those that occur in women who have already had too many births, and those which occur in women who have health problems, such as high blood pressure and diabetes that could be aggravated by pregnancy - pose health risks for mothers and/or their children. These risks to life and health summarized by "too close, too many, too old, too young" hold true for all socioeconomic groups. Clearly, general health would improve markedly if proper measures are taken to avoid high risk pregnancies and maintain healthy intervals between births.⁵⁻⁶

Results from the 1996 Saudi Arabia Family Health Survey (SFHS-96) indicate that changes

in fertility including the reduction in child mortality and the rise in age at marriage are strongly influenced by social and economic development. Through a variety of mechanisms family size that couples desire is reduced. Increasing women's control over their own reproductive lives would clearly have a major impact on their health and the growth and survival of their children. Individual choices about family size are, however, made effective through fertility regulations.⁵⁻⁶

It is often assumed that Muslim religious leaders have more conservative attitudes than the general population on family planning, yet a review of the literature reveals no specific comparison of the two groups. It seems that the views of muslim religious leaders on family planning are often misinterpreted.⁸ This study aimed to identify determinants of spacing births, and determine the attitude of females attending Al Hada Armed Forces Hospital primary health care clinics toward the family planning.

SUBJECTS AND METHODS

A cross-sectional survey, of all women aged 15-49 years who had been married before or were still married and who attended Al Hada Armed Forces Hospital (primary health care and antenatal care clinics), was conducted. All eligible women were interviewed using a questionnaire designed to elicit details of their socio-demographic and biological characteristics, beliefs, attitude and their use of family planning services, pregnancy intervals and medical history. Crowding index was defined as the number of family members/number of rooms in dwelling. Those with a history of primary or secondary infertility were excluded from the study of determinants of pregnancy spacing (n=51), but all were included in the study to determine attitudes toward family planning. Data were collected by trained primary care physicians and nurses between 1st February, 2005 and 31st January, 2006.

Birth interval was defined as the interval between reported dates of birth, rather than the inter-conception intervals. The interval between marriage and the first birth was excluded from the analysis. The period of interest in this study was that between the date of the birth making the start

of the interval either the date of the next conception, or the interview date (if no conception had occurred). If the interval is terminated by a conception, it is termed a closed interval (82.7 of intervals); otherwise, it is termed an open interval (17.3% of intervals). In order to avoid any selection bias, open as well as closed intervals were included in the analysis. However, including these intervals was likely to result in pregnancy rates that were biased downwards, because a pregnancy may not be recognized or reported until four or five months after conception. In other words, women may have been pregnant at the time of the survey but may not have been aware of it, and therefore would not have reported it to the interviewer. Their birth intervals would be misclassified as open, when they were really closed. The method used to avoid this problem was to artificially backdate the interview date to nine months before the actual interview date.

Regarding the beliefs and attitude towards the concept of family planning, data were collected from all participants by trained female health educators (n=837). A questionnaire with open and closed ended questions was utilized. The questions elicited information on the knowledge of family planning, sources of this information, contraceptive use, and the attitude of the participants towards the concept of family planning and its effect at both family and community levels. The study was conducted after obtaining the approval of the Research and Ethics committee of Al-Hada Armed Forces Hospital. Informed consent was obtained from all women willing to participate in the study (response rate was 93%).

Statistical analysis

Data were analyzed using SPSS version 11.0 software. Kaplan–Meier survival, univariate and multivariate Cox-regression analysis, which take into account censored events, were performed. The former is used for categorical variables, while the latter is for both continuous and categorical ones, the 5% level was chosen to judge the significance of the results obtained.

Since many intervals (all the open intervals) were censored, a hazards model was used for the analysis. A Cox proportional hazards model was used here. This choice is supported by the fact that the effect of the majority of covariates on the

hazards of conception is proportional to the whole duration of the birth index.

RESULTS

Socio-Demographic characteristics

The mean age of the 786 of the women included in the study was 31.95 ± 7.3 years, with a minimum of 18 years and a maximum of 49 years. Nearly one third of the participants (34.7%) were illiterate or had primary school education, while university graduates constituted 20.2% of the sample. Only 16.4% were working women.

The mean age at marriage of the participating women was 19.71 ± 3.77 with a median of 19 years while the mean age at the birth of the first child was 21.13 ± 3.68 . The mean age at marriage of their husbands was 26.90 ± 6.45 with a median of 25 years. The number of children each woman had ranged from one to 16, with an average of 4 children per woman.

Birth spacing and its determinants

The study revealed 3168 interbirth intervals among the 786 participating women. Of the 3168 interbirth intervals, 82.7 % were closed and 17.3 % were open. The mean duration of interbirth interval was 2.38 ± 1.24 years with a median of two years.

Table 1 represents the sociodemographic determinants of the interbirth spacing. It revealed that women who had finished high school (secondary or diploma) (22.9%) or had a university degree (20.2%) had significantly longer interbirth intervals (2.54 and 2.67 years respectively) than those who had no formal education (log rank test=22.13, $p < 0.0001$). Interbirth intervals for women in employment were 2.73 years compared with 2.32 years for unemployed women (log rank test=15.73, $p = 0.0001$). Also, women married to civilians, professionals or retired men had significantly longer interbirth intervals (ranging from 2.65 to 2.88 years) than those women married to military men, military officers or other military personnel (interbirth intervals ranging from 1.84 to 2.27 years and log rank test= 26.54, $p = 0.0001$).

Statistically significant differences were observed between the interbirth interval and the number of wives in the family (log rank test=5.18, $p = 0.0229$), the family income (log rank test=11.46, $p = 0.0032$), as well as the crowding index (log rank test=18.03, $p < 0.0001$). Interbirth interval was significantly shorter for families in which there were two or more wives (2.23 years), those who

Table 1: Mean duration of birth spacing in relation to sociodemographic characteristics

Sociodemographic determinants	No. (%) (n=786)	Duration in years Mean (SE)	95% CI	Log rank test (p-value)
Maternal Education				22.13 (0.0001)
Illiterate/read and write	159 (20.2)	2.29 (0.08)	2.14 - 2.45	
Primary/Intermediate	288 (36.6)	2.18 (0.05)	2.08 - 2.28	
Secondary/Diploma	180 (22.9)	2.54 (0.13)	2.29 - 2.79	
University	159 (20.2)	2.67 (0.10)	2.47 - 2.88	
Husband's education				7.44 (0.0591)
Illiterate/read/write	27 (3.4)	2.44 (0.18)	2.08 - 2.80	
Primary/Intermediate	300 (38.2)	2.28 (0.08)	2.13 - 2.43	
Secondary/Diploma	339 (43.1)	2.47 (0.06)	2.35 - 2.59	
University	120 (15.3)	2.39 (0.13)	2.14 - 2.64	
Working status				15.73 (0.0001)
Housewife	657 (83.6)	2.32 (0.05)	2.23 - 2.41	
Working	129 (16.4)	2.73 (0.13)	2.48 - 2.98	
Husband's occupation				26.54 (0.0001)
Military officer	33 (4.2)	1.84 (0.17)	1.51 - 2.17	
Other military personnel	513 (65.3)	2.27 (0.04)	2.19 - 2.35	
Technician	27 (3.4)	2.42 (0.17)	2.09 - 2.75	
Civilian employee	81 (10.3)	2.70 (0.16)	2.38 - 3.01	
Professional	60 (7.6)	2.65 (0.19)	2.28 - 3.01	
Retired	72 (9.2)	2.88 (0.26)	2.37 - 3.39	
Residence				0.15 (0.696)
Urban	735 (93.5)	2.39 (0.05)	2.30 - 2.48	
Rural	51 (6.5)	2.29 (0.15)	2.00 - 2.58	
Husband's wives				5.18 (0.0229)
One	654 (83.2)	2.42 (0.04)	2.33 - 2.50	
Two or more	132 (16.8)	2.23 (0.16)	1.92 - 2.53	
Family income				11.46 (0.0032)
Enough and save	453 (57.6)	2.39 (0.05)	2.29 - 2.50	
Enough	273 (34.7)	2.47 (0.09)	2.30 - 2.64	
Not enough	60 (7.6)	1.93 (0.10)	1.72 - 2.13	
Crowding index				18.03 (0.0000)

Table 2: Mean duration of birth spacing in relation to biological and medical characteristics

Biological and medical determinants	No. (%) (n=786)	Duration in years Mean (SE)	95% CI	Log rank test (p-value)
Age at delivery of first child				1.03 (0.5975)
<20	291 (37.0)	2.31 (0.06)	2.19 - 2.44	
20 - 29	477 (60.7)	2.43 (0.06)	2.31 - 2.55	
≥ 30	18 (2.3)	2.42 (0.11)	2.20 - 2.63	
Number of living children				26.12 (0.0000)
1	192 (24.4)	2.06 (0.07)	1.93 - 2.19	
2 - 4	279 (35.5)	2.58 (0.10)	2.39 - 2.77	
> 4	315 (40.1)	2.41 (0.06)	2.30 - 2.52	
Male to female ratio of living children				26.59 (0.0000)
More than one	173 (22.0)	2.64 (0.09)	2.46 - 2.81	
One	120 (15.3)	2.36 (0.18)	2.01 - 2.71	
Less than one	206 (26.2)	2.45 (0.07)	2.32 - 2.59	
Males only	164 (20.9)	2.39 (0.08)	2.24 - 2.54	
Females only	123 (15.6)	1.93 (0.09)	1.75 - 2.12	
History of having abnormal child				1.81 (0.1781)
No	777 (98.9)	2.39 (0.04)	2.30 - 2.47	
Yes	9 (1.1)	2.29 (0.18)	1.95 - 2.64	
Breastfeeding				15.27 (0.0001)
No	38 (4.8)	1.86 (0.13)	1.81 - 2.01	
Yes	748 (95.2)	2.41 (0.08)	2.29 - 2.52	
History of child death				0.30 (0.5848)
No	666 (84.7)	2.36 (0.05)	2.26 - 2.45	
Yes	120 (15.3)	2.54 (0.10)	2.34 - 2.74	
History of chronic diseases				6.08 (0.0137)
No	636 (80.9)	2.33 (0.05)	2.24 - 2.43	
Yes	150 (19.1)	2.60 (0.11)	2.38 - 2.81	

Table 2 (Continued)

Biological and medical determinants	No. (%) (n=786)	Duration in years Mean (SE)	95% CI	Log rank test (p-value)
Husband's chronic diseases				0.08 (0.7751)
No	669 (85.1)	2.38 (0.05)	2.28 - 2.47	
Yes	117 (14.9)	2.43 (0.10)	2.25 - 2.62	
Abnormal delivery				7.62 (0.0058)
No	651 (82.8)	2.33 (0.04)	2.25 - 2.41	
Yes	135 (17.2)	2.65 (0.16)	2.35 - 2.96	
Postpartum complications*				0.01 (0.9742)
No	762 (92.4)	2.38 (0.05)	2.29 - 2.48	
Yes	60 (7.6)	2.40 (0.11)	2.19 - 2.61	
Husband's beliefs regarding birth spacing				54.12 (0.0000)
Disagree strongly	105 (13.4)	1.80 (0.09)	1.63 - 1.97	
Don't mind	366 (46.6)	2.32 (0.05)	2.23 - 2.40	
Encouraging	282 (35.9)	2.70 (0.10)	2.51 - 2.89	
Unknown	33 (4.2)	2.29 (0.18)	1.94 - 2.65	

*Bleeding, infection, etc.

Table 3: Multivariate cox regression of the significant predictors of birth spacing

Significant predictors	Coefficient	Hazard ratio	95% CI	p-value
Maternal education				
Illiterate/read and write*				
Primary/intermediate	-0.044	0.96	0.77 - 1.18	0.691
Secondary/diploma	-0.334	0.72	0.55 - 0.93	0.011
University	-0.299	0.67	0.54 - 0.96	0.042
Working status				
Housewife*				
Working	-0.341	0.61	0.42 - 0.97	0.048
Husband's occupation				
Military officer*				
Other military personnel	-0.577	0.56	0.39 - 0.81	0.002
Technician	-0.369	0.69	0.40 - 1.19	0.183
Civilian employee	-0.699	0.50	0.33 - 0.76	0.001
Professional	-0.392	0.68	0.43 - 1.07	0.094
Retired	-1.008	0.37	0.23 - 0.58	0.000
Family income				
Enough and save*				
Enough	-0.144	0.87	0.72 - 1.04	0.121
Not enough	0.357	1.43	1.06 - 1.93	0.020
Number of living children				
1*				
2 - 4	-0.249	0.78	0.60 - 1.01	0.063
>4	-0.065	0.94	0.67 - 1.31	0.701
Male to female ratio of living children				
More than one*				
One	0.407	1.50	1.15 - 1.96	0.003
Less than one*	0.140	1.15	0.93 - 1.42	0.196
Males only	0.092	1.10	0.82 - 1.47	0.531
Females only	0.582	1.79	1.28 - 2.51	0.001
History of chronic diseases				
No*				
Yes	-0.253	0.67	0.52 - 0.96	0.013
Husband's beliefs regarding birth spacing				
Disagree strongly*				
Don't mind	-0.444	0.64	0.51 - 0.81	0.000
Encouraging	-0.640	0.53	0.41 - 0.68	0.000
Unknown	-0.380	0.68	0.45 - 1.03	0.071

*Reference category

described their income as not enough (1.93 years) and for those whose crowding index was > two persons/room (2.02 years). On the other

hand, neither the husband's level of education nor the residence was a significant predictor of the interbirth spacing.

As shown in Table 2, the length of the interbirth interval was significantly affected by the number of living children (log rank test=26.12, $P<0.0001$) and their male to female ratio (log rank test=26.59, $P<0.0001$). The shortest interbirth intervals were observed when the woman had only one living child (2.06 years) and for those who had only female living children (1.93 years). The longest interbirth intervals were reported by women who had two to four living children (2.58 years) and those who had children of both sexes with more males (2.64 years).

The interbirth interval was also influenced by the mother's history of chronic diseases (log rank test=6.08, $p=0.0137$) and that of abnormal delivery (log rank test=7.62, $p=0.0058$). Significantly longer interbirth intervals were associated with a positive history of both (2.60 and 2.65 years respectively). A significantly longer interbirth interval (2.41 years) was associated with breastfeeding (log rank test=15.27, $P=0.0001$). The mother's biological and medical characteristics, including her age at delivery of the first child, history of having abnormal child or child death, as well as history of postpartum complications, were not related to the length of the interbirth interval. Also, a history of husband's chronic diseases was not significantly associated with the length of the interbirth interval.

Considering all significant predictors of the interbirth spacing, the multivariate Cox regression revealed that a woman with higher education, working women, a woman with a husband in the military, or a civilian, or retired, a woman with a history of chronic diseases, and the husband's encouragement of the wife to space births were the only significant predictors of longer interbirth interval. Shorter interbirth interval was independently predicted by lower family income, and presence of females only or on equal number of male and female children as opposed to more male children.

Assessment of attitudes and beliefs of family planning

Attitudes and beliefs of participating women on the concept of family planning were assessed among 765 women, representing 91.4% of the total sample. Parents and family formed the first source of knowledge, representing 67.5% (516/765) followed by media and press, friends 58% (444/765) and 57.3% (438/765)

respectively. Other sources such as doctors, nurses, and teachers represented 43.9% (339/765).

Table 4: Attitude and beliefs of participating women regarding the concept of family planning (n=837)

Item	No. (%)
Knowledge of family planning concept	765 (91.4)
Source of knowledge*	
Media and press	444 (58.0)
Parents and family	516 (67.5)
Friends	438 (57.3)
Others (doctors, nurses, teachers, etc)	336 (43.9)
Opinion regarding its effect at family level†	
Positive	750 (98.0)
Negative	15 (2.0)
Opinion regarding its effect at community level†	
Positive	678 (88.6)
Negative	9 (1.2)
No effect	78 (10.2)
Usage of contraceptive methods*	
Never used	285 (34.1)
Contraceptive pills	369 (44.1)
Intrauterine devices	246 (29.4)
Safe period	45 (5.4)
Condom	24 (2.9)
Injectables	24 (2.9)
Others	27 (3.2)
Causes of non usage of contraceptive methods*	
Newly married	144 (50.5)
Wants more children	63 (22.1)
Husband refuse	33 (11.6)
Afraid from side effects	42 (14.7)
Religious causes	6 (2.1)
Others	33 (11.6)

*women gave more than one answer

†72 non-responders

Seven hundred and fifty participating women representing 98% had positive opinions of its effect on the family. However, 88.6% (678/765) of them reported a positive opinion of the effect of family planning on the community and only 10.2% reported that it had no effect on the community.

Those who never used any contraceptives represented approximately one third of the sample (34.1%). The pill was the most reported method (369 or 44.1%) followed by intrauterine devices (249 or 29.4%); safe period, condoms, injectables and others were also mentioned.

Nearly half of those who had never used any contraception were newly married. They were followed by those who wanted more children 22.1%. However, religious reasons accounted for only 2.1% of the non users (Table 3)(Table 4).

DISCUSSION

Family planning is an issue important for health and development, as well as a human rights. Muslim

countries and societies, no different from the rest of the world, aspire to reach their development goals by improving the health of their women and children.⁹

Birth intervals are growing longer, yet most are still short of the healthiest interval of 3 to 5 years.¹⁰ The median birth interval in developing countries is about 32 months, 4 months short of 3 years. This is based on the Population Reports analysis of 55 countries with Demographic Health Survey (DHS) data. On average, women in developing countries have much shorter birth intervals than they would prefer.¹⁰ Our study showed even shorter birth intervals than have been reported by women in other developing countries. This could be explained by the fact that the majority of women in this study were relatively younger at the time of conception (97% were younger than 30 years old). This may be because this group probably thought it best to have their children quickly; other mothers had already attained already their intended family size. It was proved by data analysis of DHS of the 55 countries that the largest proportions of women with intervals shorter than 3 years tended to be in those countries with higher per capita income, as may be the case in the study in Saudi Arabia.¹⁰ The explanation of short birth intervals in these countries could be that many women here want to have their children in rapid succession and then to use contraception to limit the number of children they have rather than space births.¹⁰

Expanding education and employment opportunities for women is a reason for the spacing of children. The current study as well as others have demonstrated the positive impact of women's education, particularly higher education on birth interval.¹⁰⁻¹³ In fact, women's educational attainments rather than those of their husbands have a significant impact on birth intervals. Higher educational attainment improves a woman's status and opens the door for employment, resulting in an increase in the spaces between births.^{10, 14-16} The relatively longer intervals observed in relation to working women may be a reflection of their need to care for their children and the desire for self-fulfilment by being in gainful employment outside the home. The attainment of higher education has an indirect influence on spacing, in that marriage is delayed, there are changes in reproductive norms and behaviors as well as the practice and efficacy of contraception.^{11,17-18} It

seems then that social, economic and environmental factors influence fertility through its proximate determinants.

It has been established that breastfeeding has an influence on fertility by lengthening the period of postpartum infecundability¹⁹ and through its effect on postpartum abstinence.²⁰ In our study, breastfeeding was associated with a significant fertility-inhibiting effect. The same results have been documented.^{10, 21-22} It is documented that the death of an infant reduces the length of the subsequent birth interval. Clearly, one possible reason for this is that the duration of breastfeeding is reduced as breastfeeding for 12 months reduced fertility by more than half by physiologically increasing the period of postpartum non-conception.^{10,21} It has also been explained in terms of volitional replacement, which reflects a need to replace a lost child.²³

However, in our study, we failed to prove this association. This could be attributed to the high fertility rate in our sample (four children per woman) which may mask the effect of one or two birth intervals following the death of a child. Besides, the death of a child causes a sense of increased risk of death of subsequent children. Another important explanation may be that the death of a child causes depression in the mother which then occasions vulnerability to early death of a subsequent birth.²⁴ A further detailed study focused on the effect of the death of a child on birth intervals in our community is needed.

The sex of children is an important factor that determines length of the birth interval. This is apparently observed in our community where preference for boys dominates.^{10,13,21,25-26} Previous studies indicated that boy preference put an upward pressure on fertility as couples continued to have children until they had their desired number of boys.²⁶ In agreement with the previous studies, the current study proved that having only girls was significantly associated with the shortest interbirth interval.

In the current study, it was shown that most husbands approved of family planning (82.5%). Discussion and spousal perception of the partner's attitude towards family planning were found to be significantly associated with the use of contraceptives.²⁷ The present work revealed that mothers who reported chronic medical problems were found to have longer interbirth intervals. This finding could be explained by the fact that chronically ill women are at higher risk of prenatal,

natal and postnatal complications that are more prevalent in this group of patients.

Comparison of the work/family attitudes of military couples with civilian couples showed that military couples, when viewed in light of demographic differences, were characterized as more motivated to achieve, more confident of their abilities, and more frustrated with not achieving their potential in their job.²⁸ In our study, military couples (officers or other military personnel) were associated with shorter interbirth intervals as compared to civilian employees and professionals. This could be explained by the aforementioned characteristics of military couples.

A high percent of women interviewed in our study had heard about family planning despite the low effect of programs on contraceptive methods and birth spacing implemented in Saudi Arabia. However, their main source of information was parents and family members, friends followed by media and press and finally health institutions and schools. This finding differs slightly from what was found by Tessema ZK,²⁷ in a study in Ethiopia assessing couples' knowledge of family planning. In that study, the role of the media and press was greater than that of health institutions. The reason may be that the increase in population size had not been a national concern in Saudi Arabia until recently. However, nearly 90% of the women had a positive opinion on the effect of family planning on the well-being of the family and community respectively; this was in agreement with a similar study done in Nigeria.²⁹

Consistent with other studies, our study revealed that the oral contraceptive was the most used method followed by intrauterine devices.³⁰⁻

³¹ Eighty percent of men, 86% of women; 82% of male religious leaders and 98% of female religious leaders believed that family planning was in keeping with in tenets of Islam.³² This was obvious in our study which revealed that religion had little effect on the family planning method used.

Husband's awareness of the side-effects of contraception or their refusal to use it had no effect on the percentage of the non usage of family planning. Nonetheless, in our study the husband's encouragement for family planning had a statistically significant effect on increasing the birth intervals among participating women.

Islam should not be considered a barrier to the spacing of births. Governments and non-

governmental organizations in Islamic countries as well as the international organisations should support the rational use of contraception. These efforts would help to prevent unplanned pregnancies and help families to understand the rationale behind suitable birth spacing by providing financial and political support for culturally sensitive reproductive health programs to cater for the needs of Muslim couples.⁹

Limitations and potential biases of this study could be summarized as follows. Our study was not population-based. It was based at a big hospital serving around 50000 persons in the western region of Saudi Arabia. However, it is unlikely for the determinants of interbirth interval to have been confounded by this since the results were similar to those of other countries in our region.^{7,11,12} Also, it should be emphasized that our study is based on a population in a developing country, so its findings may not be generalized to other populations with different demographic characteristics. Among the limitations of the study, was the subjectivity of the variable related to the socio-economic level of the studied population. To conclude, an analysis of the spacing of births which effects the health of Saudi women will provide planners and policy makers with useful information to help with reforms and encourage longer intervals between births. These reforms may ultimately help families decide on appropriate interbirth intervals for their children and hopefully have beneficial effects on the population and on health status of mother and child. However, further studies using a population-based approach, and possibly, the inclusion of a proper mix of newly married women as well as those who have been married for some time is necessary to ascertain a cause-effect association.

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