Birth interval: perceptions and practices among urban-based Saudi Arabian women

P. Rasheed[1] and B.K. Al-Dabal[1]

الفترات الفاصلة بين الولادات: تصوُّرات وممارسات السعوديات المقيمات في الحَضَر

بارفين رشيد، بدرية خالد الدبل

الخلاصة: أُجريت هذه الدراسة لتحديد تصوُّرات النسوة السعوديات المقيمات في الحَضَر إزاء المباعدة بين الولادات، والفترات الفعلية بين الولادات، والعوامل الاجتماعية الديمغرافية المرافقة. وشملت هذه الدراسة المستعرضة 436 من الأمهات اللاتي تتراوح أعمارهن بين 15 و50 عاماً في الخُبَر. وكانت جميع السيدات قد ولدن طفلَيْن أو أكثر في السنوات العشر السابقة. وبيَّنت الدراسة أن 5.2٪ منهن يفضِّلن فترة فاصلة تقل عن سنتَيْن، ويفضّل 28.2٪ منهن فترة سنتَيْن إلى ثلاث سنوات، في حين تفضّل سائر السيدات فترة ثلاث سنوات أو أكثر. وكان ارتفاع مستوى التعليم والوضع الوظيفي عاملَيْن مُنبئين بتفضيل المباعدة بين الولادات. وكان حوالي نصف السيدات على غير دراية بالمنافع الجسمانية المرتبطة بطول الفترة بين الولادات. وكانت الفترة المتوسطة الفاصلة بين الولادات لدى 26.3٪ منهن فقط تقل عن سنتَيْن. وخلصت الدراسة إلى أن العمر والوضع الوظيفي هما من العوامل الإيجابية المهمة المنبئة بطول الفترة بين الولادات. كما كانت موانع الحمل التي تؤخذ بالفم هي الطريقة الأكثر شيوعاً للمباعدة بين الولادات.

ABSTRACT To determine perceptions towards birth spacing, actual birth interval and associated sociodemographic factors, we carried out a cross-sectional study on 436 mothers aged 15–50 years in Al-Khobar. All had had ≥ 2 children within the previous 10 years. Only 5.2% preferred a birth interval of < 2 years, 28.2% preferred a 2–< 3-year interval, while the rest favoured ≥ 3 years. Education and employment status were predictors of birth spacing preference. About half were not aware of the physical benefits associated with longer birth interval. Only 26.3% had mean birth interval < 2 years. Age and employment status were significant positive predictors of longer birth interval. Oral contraception was the most popular method adopted for child spacing.

L'espacement des naissances : perceptions et pratiques des femmes saoudiennes en milieu urbain

RÉSUMÉ Afin de déterminer leur perception de l’espacement des naissances, l’intervalle génésique effectif et les facteurs sociodémographiques associés, nous avons mené une étude transversale auprès de 436 mères âgées de 15 à 50 ans, résidant à Al-Khobar. Toutes avaient mis au monde au moins 2 enfants au cours des 10 années écoulées. Seules 5,2 % d’entre elles ont manifesté une préférence pour un intervalle génésique inférieur à 2 ans, 28,2 % préférant un intervalle se situant entre 2 et 3 ans, tandis que la majorité privilégiait un intervalle ≥ 3 ans. Le degré d’enseignement et le statut professionnel sont apparus comme autant de prédicteurs de l’intervalle génésique préféré. Près de la moitié des femmes enquêtées ignoraient les bénéfices que peut retirer l'organisme d'un intervalle intergravidique plus long. L’intervalle génésique s’est avéré inférieur à 2 ans chez seulement 26,3 % des participantes. L’âge et le statut professionnel se sont révélés être des prédicteurs positifs d’un allongement de l’intervalle génésique. La contraception orale s’est affirmée comme la méthode de prédilection permettant de gérer l’espacement des naissances.

[1]Department of Family and Community Medicine, College of Medicine, King Faisal University, Dammam, Saudi Arabia (Correspondence to P. Rasheed: parveenrasheed1@yahoo.com).
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Introduction

Children born too close together have long been associated with an increased risk of adverse health outcomes, including infant, child and maternal mortality. Research has shown that inter-pregnancy interval is an independent risk factor for pre-term delivery and neonatal death [*1*]. Short birth intervals (< 2 years) may lead to maternal depletion syndrome, milk diminution and competition between siblings close in age for food and other resources [*2*]. Analysis of data on more than one million pregnancies in Latin America showed that short birth intervals were independently associated with increased risk of perinatal outcomes [*3*]. In India a comprehensive study of infant and child mortality based on National Family Health Survey data found that a previous birth interval of less than 24 months increased child mortality by about 67% [*4*]. A longitudinal analysis of 3370 births to women living in 70 villages of Bangladesh showed that if women delayed a subsequent birth by about 2 years, child survival improved at all ages up to 5 years. Moreover, a child born after a short birth interval (< 2 years) was 3 times more likely to suffer from malnutrition, even at age 3 years, than a child born after 2 years [*5*].

Evidence has consistently shown that a birth interval of 2 years improves the chances of survival of infants and children. However, new research suggests that a period of 3–5 years is the optimum birth interval, and saves more lives than a ≤ 2 years interval. Analysis of data from the Demographic and Health Survey (DHS) has shown that compared with an interval of 24–29 months, a birth interval of 36–41 months was associated with 26%, 43% and 51% reduction in deaths in neonatal, infant and under 5-year-olds respectively, as well as a 28% reduction in stunting and a 29% reduction in underweight [*2*]. In Bangladesh, Egypt, Indonesia and Peru, perinatal mortality rates for children born at < 24 months interval were 70, 44, 47 and 36 respectively per 1000 births. At 36 months interval, the rates for the same countries were 44, 18, 16 and 19 [*2*].

Evidence on maternal health has been provided by research conducted on over a million pregnancies in 19 countries by the Latin American Center for Perinatology and Human Development. It was observed that spacing births beyond 2 years (27–32 months) improved maternal health in terms of less likelihood of developing toxaemia, anaemia and third trimester bleeding as well as 2.5 times less risk of maternal mortality compared to birth intervals of 9–14 months. Intervals longer than 69 months were associated with increased risk of maternal death (10%), third trimester bleeding (10%), eclampsia (80%) and post-partum haemorrhage (90%) [*6*].

Worldwide, many women have birth intervals shorter than 3 years. Data based on population reports from 55 countries showed that 26% of women gave birth < 2 years after a previous birth and 31% of the birth intervals were 2–3 years [*2*]. The largest proportion of women with birth intervals < 3 years were reported from the developing countries of the Middle East region, such as Jordan and Yemen, as well as from Turkmenistan in Central Asia. It is believed that birth intervals are shorter in these countries because many women prefer to have births in close succession and then use contraceptives for limiting rather than spacing births [*7*].

There is a paucity of information on birth interval in Saudi Arabia. Among the few studies published, Madani et al. examined lactational amenorrhoea and birth interval among Saudi Arabian women from Taif in 1994. The lack of adequate information on breastfeeding and birth interval was noted [*8*]. A 1999 study reported on mean birth interval and the factors influencing it among rural women [*9*]. Another study focused on the physical and mental development of urban schoolchildren aged 9–10 years from Al-Khobar in relation to birth interval [*10*].

Not only is there a lack of data on birth interval in this region, little is known about the perception of Saudi Arabian women regarding optimum birth spacing or their awareness of the advantages and disadvantages of long and short birth intervals. Such information would help in developing strategies to promote adequate birth spacing among the local population.

Hence, we carried out this study to determine perception of birth spacing among a group of Saudi Arabian women, actual birth intervals of children born to these women during the 10 years prior to the study, sociodemographic factors influencing birth interval and use of birth spacing methods.

Methods

We carried out a cross-sectional study on Saudi Arabian women who attended primary health care centres in Al-Khobar during March 2003. The clients of these National Health Service centres in the urban area of Al-Khobar are predominantly Saudi Arabian and a largely socioeconomically homogenous group, belonging to the middle and lower social class.

Sample size was based on an estimated 56 110 married Saudi women in the reproductive age group (15–45 years) registered at the primary health care centres in Al-Khobar. With an expected frequency of 50% of Saudi women having fair knowledge and a worst acceptable rate of 45%, the minimum sample size was estimated as 357 at 95% confidence interval using *Epi-Info*, version 6. Of a total of 9 primary health centres, 3 centres having the largest catchment areas were selected for the study. All married women in the age group 15–50 years who had given birth to ≥ 2 children during the 10 years prior to the study were asked to participate in the research. The response rate was close to 95%. A slightly higher number (436) than the estimated sample size was recruited in a 2-week period.

Data on birth interval were collected using a specially designed, pre-tested questionnaire. Information was elicited from the women by a group of trained interviewers. Birth interval was defined as the time period between 2 consecutive births. Data were obtained on sociodemographic profile, perception of ideal birth interval and reasons for their choice. The participants were then asked specifically about their awareness of certain known benefits [*2,10*] related to an adequate birth interval, e.g. regarding height, weight, intelligence and school performance of children, better maternal health and lower risk of infant/perinatal mortality and morbidity.

Information was obtained from each woman on the birth intervals of all her children born during the 10 years prior to the study; data was not limited to the last 2 births. Information on births beyond 10 years prior to the study were not considered because the age range of the study population was wide (15–50 years) and older women who would have given birth 2–3 decades ago could have had shorter birth intervals than the current trend of child spacing adopted by younger women. Women were also asked about the methods of child spacing they currently used, or had used in the previous 10 years.

At the end of the interview each woman was given information verbally by the trained interviewer regarding the advantages of longer birth interval. Immediately thereafter, in the same session, she was asked whether she would space her future births adequately.

Data were analysed using *SPSS*, version 8. Distributions and bivariate analysis of data were done. Mean birth interval for all children born during the 10 years prior to the study was estimated for each woman. The mean value per woman was computed for the population mean birth interval. The chi-squared test of significance was done where appropriate. The Pearson correlation was used. Kappa value was calculated to measure agreement between the preferred and actual birth intervals. Predictors of birth interval were determined by the multiple linear regression analysis. Prior to multiple regression analysis, the multicolinearity test was done to determine the interrelationship between the valid and significant sociodemographic (independent) variables related to the women. Colinearity was measured by the "tolerance" value ($1 - R^2$), which indicated the proportion of variance in a variable that was not accounted for by the other independent variables. A tolerance value of ≥ 0.7 for each independent variable was considered the criterion for inclusion in the multiple linear regression model.

$P < 0.05$ was considered significant.

Results

Of the 436 multiparous women recruited for the study, 66 (15.1%) were ≤ 25 years of age, 255 (58.5%) were 26–35 years, 109 (25.0%) were ≥ 36 years and 6 (1.4%) gave no response. Mean age was 32 years [standard deviation (SD) 6.27]. Most of the participants (75.7%) were not employed. The majority of those employed were professionals (79.2%); the others were either working as secretaries/administrators (2.3%) or doing unskilled jobs (1.8%). Almost half the women (48.8%) had completed high school or college education; the rest had either studied up to primary/intermediate level (31.7%) or were illiterate/not formally schooled (19.5%). Corresponding figures for husband's education level were 57.1%, 30.3% and 10.6% respectively.

In response to the question on ideal birth interval, 12 (2.8%) women stated that they had no preference, 22 (5.2%) preferred < 2 years, 123 (28.2%) preferred 2 years, 159 (36.5%) 3 years, and 120 (27.5%) > 3 years. Of the 22 women who stated they preferred a shorter (≥ 2 years) birth interval, 16 were educated to less than high school level (Table 1). Among those who had high school or college education, 97.1% preferred a longer interval (≥ 2 years) ($P < 0.05$). A slightly larger proportion of the women who were employed (98.1%) favoured a longer (≥ 2 years) birth interval compared to the homemakers (93.7%); the results were, however, not statistically significant ($P = 0.08$) (Table 1).

Reasons given for preferring a short birth interval (< 2 years) included: husband's wish (50.0%), easier to take care of children in quick succession (31.8%), desire to complete family quickly (31.8%) and dictates of religion (18.2%).

Reasons given for preferring a longer birth interval included: good physical growth of children (38.7%), good health of children (43.0%) and better maternal health (58.1%). Very few women (5.6%) mentioned more intelligent children or less risk of perinatal/neonatal mortality and morbidity (2.8%). Fifteen (5.3%) women stated dictates of religion as a reason for their choice.

All the participants were then asked specifically about their awareness of certain known benefits of adequate birth interval [*2,10*]. A sizable proportion of the respondents were not aware that longer birth interval (≥ 2 years) could lead to improvement in the child's height (60.1%), weight (45.8%),

Table 1 **Preferred birth interval of Saudi Arabian women by education level and occupational status**

Variable	Preferred birth interval < 2 years (n = 22)		≥ 2 years (n = 400)		Total[b] (n = 422)	
	No.	%	No.	%	No.	%
*Education**						
Less than high school	16	7.4	199	92.6	215	50.9
High school/college	6	2.3	201	97.1	207	49.1
Occupational status[a]						
Homemaker	20	6.3	298	93.7	318	75.4
Employed	2	1.9	102	98.1	104	24.6

[a]*Not significant,* $P = 0.08$.
[b]*No preference: 12.*
Missing values: 2.
*$P < 0.05$.

intelligence (50.7%) and school performance (41.5%) as well as lowering the risk of infant and perinatal mortality and morbidity (47.3%). The majority (88.5%), however, perceived that long birth intervals would decrease the risk of maternal mortality and morbidity.

The women in the study sample were instructed individually about these specific physical and mental health advantages of longer birth intervals (≥ 2years) at the end of the interview. They were then asked in the same session about their intention regarding spacing of future births. It was encouraging to note that among 405 women who were planning future pregnancies, 81.5% were positively inclined towards adequate birth spacing. Higher level of education contributed favourably to a positive attitude ($P < 0.05$) (Table 2). When asked whether they would try to convince their husbands if they disagreed with a longer birth interval, 90% of the women responded in the affirmative.

More than half the women (53.4%) believed that the older child in a pair of siblings born with a short birth interval (< 2 years) was more likely to have a health risk while 17.2% believed that the younger sibling would be more affected; 74 (17.1%) women

Table 2 **Saudi Arabian women's intention for adequate birth spacing in future according to education level**

Education level	Intention* Positive		Negative/ uncertain		Total
	No.	%	No.	%	
Less than high school	155	75.2	51	24.8	206
High school/college	175	87.9	24	12.1	199
Total	330	81.5	75	18.5	405[a]

[a]*No intention of births in future = 31.*
*$P < 0.05$.

felt that both children in a pair would be at a health disadvantage and 30 (6.9%) felt neither child would be affected.

The mean birth interval of children born to women in the study population within the 10 years prior to the study was 33.5 (SD 17.8) months, range 9–120 months. About a quarter (26.0%) of the women had actual mean birth interval of < 2 years. Very few women in this study (5.3%) had mean birth interval of > 5 years (Table 3). More women who were educated up to high school/college level (37.7%) had actual mean birth interval ranging from 3 to 5 years compared with those who had less education (29.0%) but the difference was not statistically significant (*P* = 0.09) (Table 3). Short birth interval (< 2 years) was also more common among women whose husband's education level was less than high school (31.8%) (*P* = 0.15).

Employment status was significantly related to birth interval. The optimum birth interval of 3–5 years was more frequently observed among women who were employed (171, 39.2%) than among homemakers (143, 32.7%) (*P* < 0.05). Type of employment did not affect birth interval.

Short birth interval (< 2 years) was more common in younger women (≥ 25 years), whereas the longer birth intervals were more common in women of older age groups (*P* < 0.05) (Table 3).

Nearly two-thirds of the participants (63.9%) believed that a birth interval of ≥ 3 years was desirable, however, 21.2% of these had an actual mean birth interval of < 2 years and 53.2% had an actual mean birth interval of < 3 years (Table 4). The measure of agreement estimated by the Kappa test for preferred and actual birth interval ("no preference" category was removed from

Table 3 **Distribution of mean actual birth interval according to age and education level**

Variable	Mean actual birth interval (years)								Total
	< 2		2–< 3		3–5		> 5		
	No.	%	No.	%	No.	%	No.	%	No.
*Age group (years)**									
≤ 25	27	40.9	26	39.4	13	19.7	0	–	66
26–35	58	22.7	93	36.5	91	35.7	13	5.1	255
≥ 36	28	25.7	31	28.4	40	36.7	10	9.2	109
Total	113	26.3	150	34.9	144	33.5	23	5.3	430[a]
Woman's education level[b]									
Less than high school	55	24.9	89	40.3	64	29.0	13	5.9	221
High school/college	58	27.4	63	29.7	80	37.7	11	15.2	212
Total	113	26.1	152	35.1	144	33.3	24	5.5	433[c]
Husband's education level[d]									
Less than high school	57	31.8	59	33.0	54	30.2	9	5.0	179
High school/college	55	22.1	88	35.3	91	36.5	15	6.0	249
Total	112	26.2	147	34.3	145	33.9	24	5.6	428[e]

[a]*No response: 6.*
[b]P *= 0.09.*
[c]*No response: 3.*
[d]P *= 0.15.*
[e]*No response: 8.*
*P *< 0.05.*

Table 4 **Actual and preferred birth intervals of Saudi Arabian women**

Preferred birth interval (years)	Actual birth interval (years)* < 2 No.	%	2–< 3 No.	%	≥ 3 No.	%	Total No.
< 2	14	63.6	7	31.8	1	4.5	22
2–< 3	37	30.0	51	41.5	35	28.5	123
≥ 3	59	21.2	89	32.0	130	46.8	278
Total	110	26.0	147	34.8	166	39.2	423[a]

[a]No response: 1.
No preference: 12.
Kappa value = 0.141; P *< 0.001; agreement = 46.1%.*
**P < 0.05.*

the analysis) was statistically significant (*P* < 0.001), level of agreement 46.1%.

During the 10 years prior to the study, 90.8% of the respondents had used ≥ 1 methods for birth spacing, the most popular being oral contraceptive pills (65.1%) followed by the intrauterine device (24.5%), breastfeeding (20.6%), rhythm method (9.6%), condom (7.1%), coitus interruptus (6.0%) and contraceptive hormone injections (0.9%). The non-users of birth spacing methods (9.2%) included a greater proportion of the illiterate or non-schooled women (15.5%) compared to those with some school education (7.7%) (*P* < 0.05).

The multicolinearity test was done for the independent sociodemographic valid and significant variables related to the women. The tolerance values ($1 - R^2$) observed for women's age, occupational status and education level were 0.97, 0.81 and 0.79 respectively, indicating little relationship between them. These factors were thus included in the model of the multiple linear regression analysis to examine their effect on birth interval. After controlling for education level of the women, 2 factors, age of the woman and occupational status, were significant positive predictors of increasing birth interval (*P* < 0.05) (Table 5).

Discussion

Over the years, evidence has consistently shown that a birth interval of 2 years gives infants and children through 5 years a better chance of survival. This health message has

Table 5 **Predictors of birth interval among Saudi Arabian women**

Variable	B	Standard error	Significance	Colinearity (tolerance)
Constant	15.26	5.36	0.005	
Age (years)	0.37	0.14	0.009	0.97
Employment status	4.44	2.25	0.049	0.81
Education level	5.52	0.45	0.9	0.79

Dependent variable: birth interval (months).

been present for decades, and most mothers studied have reported that a birth interval of ≥ 2 years is best [*2*]. Not only is this concept valid in industrialized societies but it is also prevalent in traditional communities. A survey investigating family planning practices/beliefs among traditional healers in Ibadan (Nigeria) reported that their preferred child spacing period was 2–3 years [*11*]. Muslim communities have been guided by the divine script of the *Quran* in which 3 verses in 3 different suras have indicated indirectly the optimum birth interval period by specifying a suggested time of 24 months for breastfeeding and the period of pregnancy and suckling to range from 24 to 30 months (*Holy Quran* 2:233; 31:14; 46:15). This would mean that a minimum birth interval ranging of 2.5–3.0 years is adequate. It was therefore not surprising that a large proportion of the mothers (63.9%) in this study from a predominantly Islamic background also believed that a gap of > 2 years between births was a desirable norm.

Higher education level is usually linked to better health awareness and longer birth intervals [*2,9,12*]. In accordance to our expectations, significantly more women in this study with higher education level preferred a longer birth interval (≥ 2 years) than those with less education. The stresses of work outside the home usually motivate employed women to postpone pregnancy and adopt a longer birth interval, a finding which was observed in this study as well as reported from other countries of the world [*2*].

"Husband's wish" was an important factor in the choice of Saudi Arabian women who preferred the short birth interval (< 2 years). Other studies from this region [*13,14*] and South Asia [*15*] have reported the role of husbands in taking the final decisions regarding issues related to family planning and child spacing. In a study conducted in Jordan, almost half the husbands of the study population reported that family planning issues should not be discussed with wives [*13*]. Researchers therefore recommend that interventional strategies on fertility issues need to be targeted towards husbands in this region [*13,14*].

Close to half the women in this study lacked awareness about the known benefits of longer birth intervals and adequate child spacing. Studies from the Middle East and other areas have observed an association between longer birth interval and better physical growth of children [*16–19*] (S.M.N. Haque, D. Morley, unpublished report, 1996). There is also evidence that children with malnutrition, delayed teething and rickets have significantly shorter birth intervals than children without these problems [*18*]. The United States Agency for International Development has reported that 3-year birth intervals or longer are linked with the lowest risk of stunting and being underweight among children under 5 years [*2*].

Not only are there advantages of better physical growth, but a few studies conducted in Singapore [*19*], Bangladesh (S.M.N. Haque, D. Morley, unpublished report, 1996) and Saudi Arabia [*10*] have noted the influence of short and long birth intervals on mental development of children. The Singapore study found that children (9 years old) born after a short birth interval suffered as regards perceptive and vocabulary ability [*19*]. In Bangladesh, children (9–10 years old) born after a long birth interval (> 41 months) were brighter than average, more intelligent, heavier and had a bigger mid upper arm circumference than children born after a short birth interval (< 25 months) (S.M.N. Haque, D. Morley, unpublished report, 1996). Bella et al. in Saudi Arabia showed that birth interval increases were associated with more intelligent children (9–10 years old) and better school performance [*10*]. All 3 studies showed that variables of mental (intellectual) development were better correlated with birth interval than those for physical development. Information needs to be given to parents about the full range of biosocial benefits, especially regarding intellectual development of children born with adequate spacing. This knowledge could reinforce their belief in longer birth interval and could be a strong incentive for adopting an adequate child spacing period.

More than 50% of the women in our study considered the older child of a pair of siblings born within a short birth interval to be at greater health disadvantage than the younger. Only 17% of women thought that both children would be equally at risk. Very few studies have been done to compare the difference in the health risks to children with short preceding and short succeeding birth intervals. One study showed that a preceding short birth interval was more important, i.e. the younger child's physical and mental development was more likely to be affected than that of the older child [*19*]. Another study measuring similar outcome parameters found that while both siblings in a pair were adversely affected, the older was more at risk [*10*]. The conclusion therefore is that short birth intervals are a health disadvantage to both siblings in a pair, and mothers need to be educated accordingly.

Based on analyses of 55 countries, median birth interval in developing countries was about 32 months [*3*]. Mean birth interval of 33.5 months in our study is close to this figure as well as to 31.2 months observed in a 1999 study from a rural area of Saudi Arabia [*9*]. However it is higher than the mean child spacing period of 26.8 [*8*] and 26.2 [*10*] months found for births of Saudi Arabian children born more than a decade ago. This difference is possibly due to a changing secular trend of increasing birth intervals that are occurring in most countries of the world [*7*]. One of the possible reasons suggested for this change is the greater motivation of women in recent times to postpone births due to expanding opportunities for their education and employment, a situation which is also relevant to Saudi Arabia.

Moreover with the expansion and easy accessibility of health services in Saudi Arabia over the past two and a half decades, a focus on the health of mothers and children has gained momentum in the region. Though exclusive breastfeeding and duration of breastfeeding is on the decline in Saudi Arabia [*20*] especially in urban areas and among the younger population, contraceptives are easily available in the market and are used commonly [*9*]. We also found contraceptive use to be popular and this may well be a factor explaining the large proportion of women (73.9%) having birth intervals of ≥ 2 years.

New studies have reported that 3–5-year birth intervals were even more beneficial than 2 years. Researchers at the Demographic and Health Survey programme, after assessing outcomes of 430 000 pregnancies from 18 countries in 4 regions, found that children born 3–4 years after a previous birth were 2.5 times more likely to survive to age 5 than children born less than 2 years apart [*2*]. Only one third of the women in this study reported optimum birth intervals of 3–5 years and this calls for public health attention. Recent research has also shown that waiting too long between pregnancies, i.e. ≥ 6 years increases the risk of having a stillbirth regardless of previous pregnancy outcome [*21*]. Further, Huttly et al. showed disadvantages in relation to birth weight, perinatal mortality and infant mortality in urban Brazilian children born after a birth interval of > 71 months [*22*]. It was encouraging to note that birth intervals beyond 5 years were not common (5.5%) among the women in our study.

In line with other studies [*2,23,24*], our research showed that optimum birth intervals of 3–5 years were more common among those with higher levels of education, though not statistically significantly, as well as among women who were employed, indicating greater awareness of and stronger motivation for health issues among these sub-groups. Optimum birth intervals were also significantly more frequent among the older women of this study. Other reports from this region [*9*] and South Asia [*25*] have also reported longer birth intervals among older women. We agree with Al-Nahedh that prolonged breastfeeding in the older age group of Saudi Arabian women and attainment of preferred family size by many of them could be possible reasons for this finding [*9*].

About a quarter of the women of this study had mean birth interval of < 2 years and 35.1% had waited between 2–3 years. This is similar to the reported average for 55 countries according to a 2002 report [*2*]. Moreover, many women desire longer birth intervals (≥ 3years), but more than half of the non-first births occur less than 36 months after the previous birth in developing countries [*2*]. Not only are these women unable to achieve their reproductive goals, but they fall short of the 3–5 years intervals that new evidence suggests are healthiest. In Kenya, median birth interval was 35 months compared with preferred birth interval of 49.1 months [*2*]. Our findings also showed that the agreement between the preferred and actual birth intervals was < 50%, indicating a weak relationship. Although two thirds of the women preferred a spacing period of ≥ 3 years, more than half had birth intervals that fell short of 3 years. However it was encouraging to note that the intention of women after having the specific health advantages of longer birth intervals explained to them, was positive for adequate spacing of births in future and their resolve to convince their husbands if they disagreed.

Among the variety of contraceptives used, oral hormonal pills for women were the most popular, a finding also reported by researchers from this region [*12*] and other areas [*26*]. On the other hand, use of the condom was not common. This supports the results from other Arab [*13,14*] and developing countries [*15,27*] where males generally show a resistance to the use of condom. We suggest that education on birth interval and contraceptives should also be targeted toward men making them aware of a shared responsibility on the issue of child spacing.

Breastfeeding is associated with a delay in the return of ovulation after birth and hence is an important factor in increasing birth intervals. However, the impact of breastfeeding on fertility is particularly great in populations that have extremely long periods of exclusive breastfeeding and little contraceptive use [*28,29*]. This relationship should be examined in a future investigation.

The findings of the current research cannot be generalized to all Saudi Arabian women since the study was not community based, but conducted among users of the primary health centres of an urban area.

From the evidence available in recent years (2002), children are healthier at birth and more likely to survive with a birth spacing period of 3–5 years [*2*]. In the local region, though birth intervals beyond 2 years are largely favoured, women need to be informed about new research findings on health advantages related to the optimum birth interval of 3–5 years. It is therefore essential that health programmes convey this message to parents and future parents. We agree with the Hopkins report that child spacing is a matter of choice and that couples need to make spacing decisions based on personal preferences and situation, as well as on accurate information [*2*]. The message of optimum birth interval has to reach the people, and the responsibility for this rests with those involved in the health care of the community.

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