Fertility Behaviors of Grazing Groups in Suman and Northern Parts of Saudi Arabia

By

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Abstract:

Studies of fertility behaviors of pastoral groups in general and Arab Bedouins in particular are very scarce, largely due to the difficulty of collecting information about them, in addition to their shrinking numbers. Therefore, the purpose of this study is to present fertility levels of nomadic and pastoral groups in Suman desert and northern parts of Saudi Arabia, and examine the determinants of their fertility behavior. The effect of several demographic, social, economic and geographic factors on fertility will be tested. Questionnaire interviews that were conducted in Suman and northern parts of Saudi Arabia during the last three months of 2005 were the source of data for this study. The data collected include demographic and social characteristics of 452 families. These families were living in the desert permanently or temporarily at the time of the survey. Some were originally Bedouins, but had settled down in villages and towns and kept strong ties with the desert. A regression type of analysis was adopted in the study. It is found that age at first marriage, child death, education, living in monogamous marriages, and son preference are the most important determinants of fertility behavior. Women living in families with low income had smaller number of children compared to other income groups. It is noteworthy that fertility level is significantly higher for women living in monogamous unions compared to polygamous ones. In general, polygamous marriages are not uncommon in these pastoral groups. High illiteracy rate and low usage of contraceptives were also noticed. Despite moving to town and living a modern life, their reproduction values stayed strong and thus not easily eradicated.

Key Words: Bedouins, Nomads, Fertility, determinants, contraceptives, Saudi Arabia, Grazing Groups, fertility in Saudi Arabia, Saudi Arabia, Saudi Population, Arab Fertility.

1. Introduction

Fertility is an important component of population change, and therefore, has attracted the interest of scholars and policy makers. Several efforts have been made in order to understand the determinants of fertility and formulate appropriate theories and models such as Davis and Blake (1956); Becker (1960), Bongaarts (1978, 1983, 1993), Easterlin (1975) and Caldwell (1976; 1982). On the other hand, the studies of fertility in Arab countries are apparently increasing (Fargues, 1989, Courbage 1994 and Al-Qudsi, 1998). While there are some studies that have been concerned with one aspect or another of pastoral and Bedouin life (Al-Krenawi 2001), much fewer studies have been interested in reproduction behaviors of pastoral and Bedouin groups. One of the earliest studies of Bedouin appeared in mid. 20th century (Muhsam, 1951, 1956).

In Saudi Arabia, there have been some studies of fertility in general (Al-Mazrouq et. al. 1993, Al-Otaiby 1994 and Al-Obaidi 1995), but there has been no studies on fertility of pastoral or Bedouin groups.

Research Objectives:

The numbers of pastoral groups, including Bedouins are shrinking due to the repeated droughts, harsh life, urbanization and modernization. In the past, Bedouins comprised over 50% of the population of Arabian Peninsula in 1930 (Hamza 1933), but now they represent no more than 1%. Despite the importance of understanding the demography of nomads, studies of fertility behaviors of pastoral (grazing) groups in general and Bedouins in particular are very scarce, largely due to the lack of data. Therefore, the objectives of this paper are as follows:

a) To present fertility levels in two grazing groups in Suman and Northern parts of Saudi Arabia, and

b) To examine the determinants of the fertility behavior of women across different grazing groups and geographic areas. The effect of several demographic, social, economic and geographic factors on fertility will be tested, such as age at first marriage, education, place of birth, infant mortality, contraception and style of living.

2. Data and Method of Analysis:

2.1. Data

As noted earlier, this paper is concerned with grazing groups who own herds of animals (i.e. camels, sheep and goats) in the deserts of Suman and northern parts of Saudi Arabia (i.e., parts of Al-Jouf and Nothern Borders). Data of demographic survey that was conducted in Suman and Northern parts of Saudi Arabia during last three months of 2005 was used. It consisted of about 452 families.

For this paper, only married women in their reproductive ages (15-50) were included. Since the use of contraceptive is limited, the reproduction age is extended for the purpose of this study up to the age 50. And a regression type analysis was adopted for identifying important determinants of fertility behavior of grazing group.

2.1. Sample Characteristics:

Based on the survey data, it was found that a large proportion of heads of grazing families were born in the desert (i.e. outside cities and villages) with some differences between Suman and northern part of the Kingdom (Khraif, et al. 2008). It was also found that 64% of heads of families were living permanently with their herds. A larger proportion of these families were found in the northern part of the Kingdom, compared to that in the desert of Suman. This reflects changes that the nomadic life style has been undergoing, which means that not all heads of families were living with their herds in the desert anymore. That is, some heads of families were still living permanently with their herds while others were living in villages and towns and visit the desert periodically to look after their herds of animals.

On the other hand, the family size in this group is relatively large, reaching about nine individuals on average. The size of families living permanently with their herds was even larger in size (10 individuals). On the opposite side, the size of the families living temporarily in the desert with their herds was a little smaller (i.e. less than 9). It was also found that having a house maid was uncommon among grazing families in general, but there were some cases.

2.3. Method of Analysis

In order to accomplish the objectives of this paper, several demographic, socioeconomic, and geographic variables are used for this purpose (Table 1). Theses variables represent personal characteristics such as age, age at first marriage, and work status, in addition to familial attributes such as type of residence, type of housing, polygamy etc. Some of them are nominal in nature and included in the regression equations as dummy variables, while others are measured in a ratio scale and used as such age or ordinal, and classified into groups such as level of education.

Table 1. Variables and Their Operational Definitions

Variable	**Operational Definitions**
CEB	Children ever born per woman
Age at first marriage	Years
Age	Years
Wife's Education	1= illiterate
	2 = read and write
	3 = elementary
	4 = secondary
	5 = high school
	6 = university or higher
Work Status	1 = working, 2 = not working
Residence	1 = permanently in desert,2 = not permanent
Place of Residence	1= still in Desert, 2= living in town
Home Ownership	1 = own, 2 = rent, 3 = otherwise
Type of House	1 = tent and alike, 2 = traditional 3 = villa, 4 = others
Contraceptives	1 = yes, 2 = no
Child deaths	Whether or not a woman experienced a child death
Polygamous Marriage	1=single wife, 2 = multiple
Son Preference	Sex ratio of children Ever Born.

3. Analysis

Based on the survey data, the average family size is a little over 11 persons. However, the average number of children ever born is about 6.5 per woman (Fig 1). This is not very surprising since most women are at the end of their childbearing age and contraceptive use is uncommon. In addition, the majority of younger couples prefers urban life and had moved to live in towns. Thus the numbers of Bedouins are shrinking.

It is noteworthy that despite the relatively high level of fertility in this group, it is evident that fertility in Saudi Arabia has taken a declining trend in recent years and fertility transition is clearly underway in the country. Rates are dropping faster than expected. The TFR came from as high as 7 in 1987 to about 3.2 in 2009.

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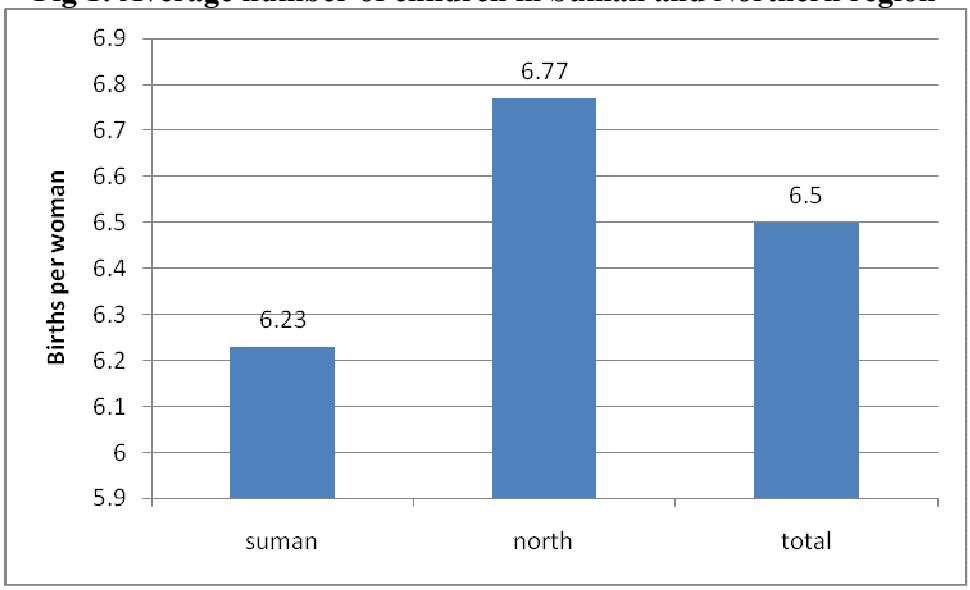
Fig 1: Average number of children in Suman and Northern region



3.1: Levels of fertility by spatial, demographic and socio-economic characteristics

It is very useful to present fertility levels by important woman's characteristics, familial attributes and geographic areas.

First of all, the data clearly show that there is a relationship between the average number of children and age at first marriage (Table 2). As age at first marriage increases, the average number of children decreases in both Suman and the Northern area. The correlation coefficient between fertility and age at first marriage was found to be (-0.15), which is relatively low, but significant at 0.01. In addition to that, based on the results of the analysis of variance (ANOVA) shown in Table (2), the relationship between these two variables is statistically significant at 0.001.

Similarly, education is found to be strongly related to fertility. Illiterate women tend to have a larger number of children than those with a higher level of education. As shown in Table 2, illiterate women were found to have about seven

children on average whereas woman who obtained a university degree had three children on average. Contrary to this, the level of husband's education has a much weaker relationship with fertility. Based on both the analysis of variance (ANOVA) and Pearson correlation coefficients, it seems that wife's education is more strongly related to fertility than husband's educational attainment. The importance of each of these two explanatory variables and their contribution in explaining fertility behavior will be examined in the next section.

Even though the number of working women is very small, the results show that the number of children-ever-born is slightly different on the basis of work status. While a working woman has 5.5 on average, a non-working woman has a little less than seven children. These differences are not statistically significant.

Although not significant, it is surprising to notice some difference in fertility levels between one area and another. The average number of children is higher in the Northern area compared to Suman. The average number of children reaches 6.2 and 6.8 in Northern area and Suman respectively.

Child death is also found to be strongly related to fertility among Bedouin women. Those who experience the death of one child or more tend to have a larger number of births in both Suman and Northern area. For instance, the average number of live births is less than six for women who have not experienced death of any of their children, but women who lost any of their children have about 9 children on average. The correlation coefficient between child-ever-born and number of child deaths as well as ANOVA is statistically significant at 0.05 (App. A).

The use of contraceptives is very limited. Only 3% of women had ever used contraceptives. The differences in the levels of fertility between women who use contraceptives and those who do not, are statistically significant, with some differences between Suman and Northern area. However, it is noteworthy that this issue is very sensitive, especially when the husband is the respondent.

Polygamous marriages are common in the grazing group in Saudi Arabia. The proportion of women who live in polygamous marriages reached about 46% of the total married women in the sample, with little difference between the major areas (i.e. 42 and 48 in Suman and Northern areas respectively). It is very interesting to find that monogamous families have more children than polygamous families. Women who lived in monogamous marriages had a little more than 7 children on average, while women who lived in polygamous marriages had less than 6 children. These differences are found to be statistically different at 0.001. It is noteworthy, however, that the proportion of polygamous marriages amounted to 32% when computed for husbands.

It is very surprising that the type of residence (i.e. whether or not a family lived permanently in the desert) had little impact on fertility behavior. This would suggest that Bedouin values and traditions last for a long time even after moving to towns and living there. This reminds us of the findings of AbuLughud (1969) regarding rural migrants to Cairo.

Results also show that home ownership in towns or villages was associated with lower fertility. The average of children was 6 and 7 for women living in families who owned homes and those who did not, respectively. Therefore, this relationship is statistically significant at 0.05.

Table 2
Average number of children-ever-born by demographic, social, economic, and geographic characteristics: ANOVA Results

Variable	Fertility level (average children-ever-born)		
	Total Sample	Suman	Northern
Major Regions (F-Test)#	(2.22)		
Suman	6.23		
Norhern Region	6.77		
Age at first marriage	**(4.95)****	**(99.33)*****	**(0.752)**
18 or less	7.06	7.06	7.07
19-24	6.06	5.34	6.65
25 +	5.68	3.33	6.24
Correlation with Dept Vble	-0.15**	-0.34***	-0.08
Woman Education	**(6.33)*****	**(4.16)*****	**(2.50)***
1- illiterate	6.98	6.98	6.97
2 – read or write	5.22	5.48	4.29
3 – elementary	4.96	5.35	3.83
4 – secondary	4.62	4.75	3.00
5 – high school	3.63	3.28	6.00
6 – University or higher	3.00	2.67	3.25
Husband's Education	**(2.41)***	**(2.59)***	**(0.61)**
1- illiterate	6.85	7.05	6.79
2 – read or write	6.40	6.12	6.58
3 – elementary	6.56	6.12	7.69
4 – secondary	5.14	4.87	6.17
5 – high school	6.00	5.38	8.00
6 – diploma	3.00	2.67	3.50
7 – University or higher			
Work status	**(0.97)**	**(1.80)**	**(0.03)**
Working	5.55	4.40	6.50
Not working	6.62	6.44	6.76
Use of contraceptives	**(8.95)****	**(8.62)****	**(0.31)**
Use	4.69	4.52	5.75
Don't use	6.71	6.58	6.79
Type of House	**(1.64)**	**(2.31)**	**(0.12)**
Tent and alike	6.87	7.16	6.77
Traditional House	6.50	5.63	6.97
Villa & Apt	6.16	5.99	6.57
Polygamy	**(19.13)*****	**(9.68)****	**(16.67)*****
Monogamous marriage	7.23	6.88	7.56
polygamous	5.69	5.34	5.94
Type of Family's Residence	**(1.72)**	**(3.68)***	**(0.74)**
Permanent	6.80	7.07	6.70
Temporary of Visit	6.32	5.96	6.84
Settlement in Towns	**(0.327)**	**(0.55)**	**(0.16)**
Still in the Desert	6.80	7.07	6.70
Settled during last 5 years	6.55	6.00	6.67
Settled 5-15 years ago	6.44	6.29	6.60
Settled before 16 years or more	6.27	5.81	6.80
Type of Head's Residence	**(3.10)**	**(1.81)**	**(3.44)**
Permanent	6.81	6.69	6.86
Temporary of Visit	6.18	5.98	6.53
Home ownership	**(8.21)****	**(5.40)***	**(1.78)**

Own	5.99	5.81	6.28
otherwise	7.01	7.03	7.00
Family Monthly Income	**(2.30)**	**(1.23)**	**(1.80)**
Less than 3000 SR	5.94	5.58	6.11
3000-5999	7.11	6.93	7.39
6000-9999	6.48	5.94	7.14
10000 or more	6.74	6.33	7.23
Child Deaths	**(45.95)*** **	**(29.09)*** **	**(21.00)*** **
No deaths	5.89	5.46	5.66
One child or more	8.64	8.31	8.08
TV Ownership	**(1.38)**	**(6.47)** **	**(1.03)**
yes	6.32	5.78	7.10
no	6.73	7.12	6.56
Presence of a Servant	**(5.03)***	**(1.81)**	**(0.29)**
no	5.60	5.51	6.11
yes	6.70	6.53	6.80

(*) Significant at 0.05, (**) significant at 0.01, (***) significant at 0.001

Values in parenthesis are results of ANOVA (i.e., F-Test).

The data show that family planning is not widespread in the country. Only three percent of married women in their reproductive years reported the use of contraceptives compared to well above 30% at the level of the country as a whole.

Since the average monthly income is not linearly related to CEB, grouping into categories is necessary. Results of analysis of variance showed that there were little differences among income groups. It should be noted here that it is difficult to collect income data because of its sensitivity on one hand and the confusion over different sources on the other.

3.2. Some determinants of reproductive behavior

In order to determine important determinant of fertility behavior, multiple regression analysis is used and results show that a number of the independent variables have significant effect on fertility. Few regression coefficients of variables such as husband's education, work status, use of contraceptives, and type of family residence are not statistically significant. Age of woman is introduced as control variable.

In order to test the consistency of our results two regression models were estimated; one with all independent variables (Model 1), and another with only the significant ones (Model 2), and little differences in regression coefficients were observed.

Among the significant variables, age at first marriage is one of most important variables that explain fertility behavior. This is consistent with results of most fertility studies.

Although illiteracy rates are very high among women in the study group, it is found that a woman's education is a very important variable. As educational level increases, fertility decreases significantly. It is noteworthy that the results have not changed even when education is introduced in the model as dummy variables (results not included here), this is one hand. On the other hand, husband's education has been found not to have a significant effect on fertility. This is probably due to the correlation between these two variables (i.e. r=0.58).

It is also found that infant death affects fertility positively. Infant deaths shorten the period before the next pregnancy and consequently lead to more births.

This result is expected since most, if not all, fertility studies found similar results in different parts of the world.

It is interesting to find that women in monogamous unions have a larger number of children compared to those in polygamous settings. The regression coefficient is highly significant. While it is difficult to give only one concrete explanation for this result, previous studies have indicated similar results (Muhsam 1956 and Josephson 2002).

In addition, low income level appears to be associated with lower fertility level compared to high income level. While it is not easy to explain this finding, one could speculate that this is because women living in families with high income would have a better chance to a healthier life which could reflect on their reproduction health.

Table 3
Some Determinants of Fertility Behavior: The Results of Regression Analysis

	Full Model		Short Model		
Independent Variable	B	t-value	Independent Variable	B	t-value
(Constant)	6.755	2.785**	(Constant)	2.894	2.640***
Woman age	.162	8.252***	Woman Age	.164	8.768***
age at marriage	-.185	-5.090***	Age at marriage	-.187-	-5.263***
education	-.556	-2.708**	Education	-.327-	-2.185*
Child Death (at least one)	1.850	4.971***	Child death	1.874	5.319***
Home Ownership	-1.059	-2.029*	Monogamous	1.472	5.121***
Family Residence (Not Permanent)	-.561	-1.078	Region	1.126	3.610***
Contraception (use)	-.177	-.269	Monthly income (low)	-.896-	-2.599**
Woman work Status (work)	-1.626	-1.665	Monthly income (high)	-.137-	-.377-
Husband's Educ	.186	1.141	Son Preference	-.006-	-3.275***
monogamous	1.555	5.187***			
Region (North)	1.059	3.140**			
Monthly income (low)	-.895	-2.425*			
Monthly Income (middle)	-.203	-.530			
TV Ownership	.247	.493			
Son Preference	-.006	-2.942**			
F-Test	15.73***		27.26***		
Cases	376		392		
Adjusted R^2	0.37		0.38		

(*) Significant at 0.05, (**) significant at 0.01, (***) significant at 0.001

In addition, son preference seems to be one of the variables that significantly affect fertility. Therefore, lower fertility is associated with large sex ratio of children-ever-born and vice versa. This means that women with fewer or no sons tend to continue bearing children until they achieve the desired number of sons. This finding is consistent with findings of other fertility studies in some developing countries such as Syria, Iraq, Jordan, china and India (e.g. Graham and Ulla Larsen 1998, Arokiasamy 2002). It implies that the value of children differs by sex (Al-Qudsi 1998, Khraif 2001).

Geographic variables are significant in explaining variations of fertility. When the dummy variable is introduced to represent Suman and Northern Region, it is found that a women living in Northern region have a larger number of children than those in Suman desert (base category). This could be explained by the fact that Suman is not far away from major urban centers in Riyadh and Eastern Province and therefore, it is affected by sedentarization, urbanization and modernization.

Due to the limited number of women who are engaged in formal jobs, the regression coefficient is not statistically significant at 0.05. This is not surprising in Saudi context. Other studies had shown similar finding which was probably due to the fact that working women in Saudi Arabia are given maternity leave when they have birth. This leave consists of a two month vacation with pay (Khraif 2001). This situation could be linked to the high value of children in Bedouin communities. As the value of children becomes high, the effect of women's participation in the labor force weakens (Easterlin 1985).

In addition, results show no statistical evidence of an effect of the type of family residence, TV ownership and use of contraceptives

The overall explanatory power of the regression model is satisfactory (R^2 = 0.36), which is not uncommon in regression models used with individual data. However, this indicates that the model was able to explain 36% of the variations in the dependent variable (fertility behavior).

4. The Conclusion

Due to limited studies of Bedouin fertility, this paper attempts to further our understanding of the fertility behavior of this pastoral or grazing group in Arabian Peninsula, especially in Suman and desert in northern Saudi Arabia. Regression analysis is used to identify the major factors affecting reproduction behavior on the basis of data from questionnaire interviews with grazing families. The main findings can be summarized as follows:

1 – The Average number of children-ever-born is very large (6.5), compared to TFR for the country which reached about 7.0 in 1985, then declined to 4.5 in 1999 and then to 3.2 in 2009.

2 – It is found that polygamous marriages are common. There were about 46% of women in the sample lived in polygamous marriages. It is noteworthy that the proportion would be a little lower, if computed for husbands (32%).

3 – Several woman's characteristics and familial attributes were found to be related to fertility behaviors. More importantly, age at first marriage, child death, type of marriage and educational attainment are found to be strongly related to fertility. Home ownership and contraceptive use are also found to be related to fertility. That is, fertility levels vary significantly on the basis of these characteristics.

4 – Contrary to our expectations, the type of residence (i.e. permanent in the desert vs. temporary or seasonal) was found to have little or no impact on fertility.

This is probably because of the fact that values and traditions of Bedouin are deeply rooted and not easily eradicated by sedentarization in towns and villages.

5 – Regression analysis revealed that age at first marriage, type of marriage (monogamous vs polygamous unions), women's educational attainment, son preference and child death are the most important variables in explaining fertility behavior in Saudi Arabia. Other variables were also found to be significant determinants of fertility such as income and geographic region, this is on one hand. On the other hand, husband's education, the use of contraceptives, type of residence and TV ownership are found not to have significant contribution in explaining the variations in children-ever- born (CEB).

6 – It is found through the regression analysis that fertility level is significantly higher for monogamous unions compared to polygamous ones.

7 – In the light of the social changes that the Saudi society had been experiencing as a result of remarkable expansion in female's education and the ongoing sedentarization process, we would expect their number to have shrinked during recent years. The fertility level has also to be affected by socio-economic changes that the country is undergoing, but apparently their reproduction values are not easily eradicated by modernization and urban life style.

Moreover, the findings of this study may have important policy implications, especially in formulating population policy pertaining to women's education and their reproduction health.

Finally, it is very clear that there is an urgent need for future studies in order to further the understanding of the reproduction behavior of different social groups.

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Appendix (A) Pearson Correlation Coefficient between fertility and some independent variables

Independent variable	Correlation coefficient
Age	0.45*
Age at first marriage	-0.15*
Woman’s education	-0.27*
Child deaths	0.32*

(*) significant at 0.01