

Reproductive health profile and circumcision of females in the Hali semi-urban region, Saudi Arabia: A community-based cross-sectional survey

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Citation: Milaat WA, Ibrahim NK, Albar HM. Reproductive health profile and circumcision of females in the Hali semi-urban region, Saudi Arabia: A community-based cross-sectional survey. *Ann Saudi Med* 2018; 38(2): 81-89 DOI:10.5144/0256-4947.2018.81

Received: January 28, 2018

Accepted: February 6, 2018

Published: April 5, 2018

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Funding: The project was funded by the Zam Zam Non-Profit Organization.

BACKGROUND: Improving the reproductive health of females has become the focus of the developmental efforts of many nations.

OBJECTIVES: To identify the reproductive health style of married females, and to determine the prevalence and predictors of circumcision among girls aged ≤ 18 years in Hali semi-urban region.

DESIGN: A cross-sectional household survey

SETTING: Houses in Hali, Al-Qunfudhah governorate, western Saudi Arabia during 2017.

SUBJECTS AND METHODS: A multistage systematic cluster random sampling method was used to select participants. A validated questionnaire was used in interviewing the head of the selected houses.

MAIN OUTCOME MEASURES: Reproductive health profile of women, and circumcision of girls.

SAMPLE SIZE: 365 households.

RESULTS: Reproductive life starts early in the Hali region as 41.4% of women are married at or before 18 years of age. Consanguinity was recorded in 57.0% of houses. The prevalence of grand multiparity (GMP) was 54.7%; it was significantly associated with current maternal age, age at marriage, low educational levels of both parents and husbands with non-professional jobs. Current use of birth control methods was reported by 28.9% of families, and oral contraceptives (OCs) were the commonest method. Contraceptive use was significantly associated with higher educational levels of both parents and with women having professional work. The prevalence of circumcision was 80.3%. Circumcision was most frequent (59.4%) at age 7 years or less, and almost always done by doctors (91.4%). Hemorrhage (2.9%) and fever (2.3%) were the minimal recorded complications. Girls with higher parental education, enough income, no parental consanguinity, and whose mothers married at an older age had slightly lower rates of circumcision, but the difference was without statistical significance.

CONCLUSION: The pattern of early female marriage, high consanguinity, GMP, low contraceptive use, and a high frequency of circumcision in girls was apparent in Hali. Public health education and legislative policies are needed.

LIMITATIONS: Recall bias may affect the reported frequency of circumcision, and related complications.

CONFLICTS OF INTEREST: None.

Improving the health status of females relating to pregnancy and delivery has become the focus of development efforts in many countries.¹ The health of females is partially affected by the socio-economic status of the family and is controlled by a group of beliefs, traditions, and practices in this society. Female reproductive health style and health-related practices are particularly affected by these traditions and other social beliefs. Female age of marriage, consanguinity between parents, average parity of mothers, use of contraceptive methods and female circumcision are some of these reproductive practices.

Saudi Arabia has no legally defined age for marriage but an old study (1995) recorded that the mean age at first marriage was 17 years for urban and 16 years for rural females.² Consanguinity between parents is a common practice in Saudi Arabia and other Arab countries and the rate varies significantly ranging from 10.6% to 67.7% with higher rates in rural areas.³

Parity levels for the Saudi females are considered high in comparison to the West. Grand multiparity (GMP) is defined as a parity of five or more births.⁴ GMP can be associated with multiple obstetrical risks.^{4,5} Similarly, failure to use family planning methods can adversely affect the health of the mother, the children and the whole family.⁶

Female genital mutilation/cutting (FGM/C) remains a major public health issue in many countries.⁷ It is defined as "all procedures that involve partial or total removal of the female external genitalia and or injury to the female genital organs for cultural or any other non-therapeutic reasons".⁷⁻⁹ Female circumcision is still under controversial discussion in Saudi Arabia.⁷⁻⁹ Although UNICEF admits that the exact number of girls and women who have undergone FGM/C is unknown, it documents that at least 200 million girls and women in 30 countries in the world have been subjected to the practice. The practice is documented heavily in most African and some Middle East countries as well as other parts of India and Indonesia. Female circumcision is still also present in the Arabian Gulf region.¹⁰ A study in Kuwait and Saudi Arabia reported a prevalence of 38% for FGM among pregnant women.¹¹ Data on the prevalence and age of conduction of circumcision vary by source. The majority of girls experienced FGM/C before age 5 years in most of the countries. Data from Yemen revealed that the prevalence of FCM/C among females was 19%, and 85% of them experienced this practice within their first week of life.¹⁰

An estimated 100–140 million girls and women worldwide are currently living with the consequences of FGM/C.⁸ FGM/C can result in severe pain, hemorrhage

and poor birth outcomes.⁷ Most of the studies done about FGM/C are hospital-based and originate from records. Some studies were done in Saudi Arabia on the effect of circumcision on cyst formation or sexual function.¹² Clinical research conducted in 2007-2008 on the possible connection between female sexual dysfunction (FSD) and FGM/C at a Jeddah clinic found that half of the females with dysfunction had been mutilated.¹³

Although reproductive health profiles are crucial factors for the health of females, no adequate studies have been done on this important issue in semi-urban and rural regions in Saudi Arabia. Also, there is no community-based health prevalence study done on female circumcision through household surveys. Such a study could shed light on these issues and identify areas for further study and intervention. The current study was done to identify the reproductive health style of married females, and to determine the prevalence and predictors of circumcision among girls aged ≤ 18 years in the Hali semi-urban region, Al Qunfudhah, western Saudi Arabia.

SUBJECTS AND METHODS

The current study was part of a community-based household survey in the Hali region at Al-Qunfudhah governorate, on the western coast of Saudi Arabia. Hali is considered the largest region of the Al-Qunfudhah governorate and is composed of semi-urban and rural areas with an agricultural lifestyle. The project was funded by the Zam Zam Non-Profit Organization (NPO), as a part of its community work for sustainable development of the region.

This household survey was done using a cross-sectional approach. Houses were selected through a multi-stage random sampling method. A cluster random sampling technique was done by dividing Hali region into 30 clusters, using the official map of the region. Twelve houses were chosen from each cluster (equal allocation technique) and houses were selected from each cluster using a systematic random sampling method (every 7th house). In each cluster, the team started from the center of the district going clockwise to select houses. During the fieldwork, five extra houses were selected. From each house, data about one wife (first wife if more than one) was taken. If there were girls less than 18 years in the house, data about the first one in the family was collected.

The surveying teams composed of local doctors, male nurses and health workers from the health care centers in the region. These teams were familiar with the population and the location, understood the distribution of houses in the region and were welcomed

by the households. They were supervised by staff from King Abdulaziz University. The teams were trained to conduct all parts of the house survey through a series of practical workshops.

All heads of the households (usually males) who agreed to participate in the study were interviewed by male members of the team. The husband usually remembers all information on the reproductive health profile of his family (for one wife only), and data on his daughter. Females in semi-urban areas usually reject such interviews. Daughters ≤ 18 years usually do not recall circumcision, as it is usually done at a very young age. If the head of the family was female, then a female member of the team interviewed her.

The survey data was collected using a constructed, validated, interview questionnaire. The face and content validity of the questionnaire were assessed by two experts in the field. The internal consistency reliability using Cronbach's alpha test was 85%. The questionnaire collected data about personal and sociodemographic information. The reproductive health style of the wife for her age at marriage, consanguinity between couples, gravidity, parity, the current use and the types of contraceptive methods (if any) were also collected.

The questionnaire included also part of the history of the circumcision of girls, which was obtained only if there was a girl aged ≤ 18 years in the house. If circumcision was done, questions were asked about the age it was done, the person who did it, and the occurrence of complications (if any). Because of the nature of this part of the interview, denial was expected. Hence, the survey needed to come up with some interviewing technique to persuade the head of the household to give valid answers. The teams were trained to use the confident questionnaire-trust building approach. This was done through building rapport between the interviewer and the interviewee regarding the secrecy and privacy. Furthermore, delivering of health services such as measuring blood sugar and blood pressure, and questions on female circumcision were saved until the end of the interview. The interviewers indicated that there is no social stigma or legal consequences for the circumcision practice in the legal system.

Analysis of survey data was done using IBM SPSS version 20 (<https://www.ibm.com/products/spss-statistics>), with descriptive and inferential statistics. Chi square test, odds ratio and 95% confidence intervals (CI) were calculated. All P values $< .05$ were considered significant.

Ethical statement: Approval for the study was granted by the Research Ethics Committee (REC) of Faculty of Medicine, King Abdulaziz University, with

Table 1. Reproductive life style and practices of married females in Hali region.

Characteristics	Number (%)
Age of female marriage (n=302; missing=63)	
15-18 years	125 (41.4)
19-24 years	120 (39.7)
25 years and above	57 (18.9)
Consanguinity between parents (n=365)	
No consanguinity	157 (43.0)
Consanguinity	208 (57.0)
- First level cousins	107 (29.3)
- Second level cousins	14 (3.8)
- Other relations	87 (23.9)
Current pregnancy	
Yes	34 (9.3)
No	301 (90.7)
Grand multiparity (n=296 ever pregnant)	
Yes (≥ 5 children)	162 (54.7)
No (< 5 children)	135 (45.3)
Contraceptive use (n=277, Not applicable*=88)	
Yes	80 (28.9)
No	197 (71.1)
Type of contraceptive used (n=80)	
OCPs	38 (47.5)
IUDs (loop)	29 (36.2)
Injections	3 (3.8)
Condom for husband	3 (3.8)
Safety period	3 (3.8)
Others	4 (5.0)

* Not applicable: Pregnant at time of the study, no children, or at menopause.

the Reference Number (HA-02-J-008). Approval was also taken also from the Health Governorate of Al Qunfudhah. Informed consent was taken from each accepted participant.

RESULTS

In the sample of 365 visited houses (representing 8.4% of all houses in Hali), 99.7% were headed by Saudi

males, and their ages ranged from 20 to 90 years with a mean (SD) of 51.0 (15.3) years. The wives aged between 17 to 85 years with a mean of 42.2 (12.8) years. A high percentage of fathers (65.8%) and mothers (77.3%) had less than university education.

The mean (SD) parity was 5.4 (3.4), gravidity 4.9 (3.4), and abortion was 1.9 (1.6). **Table 1** shows the main reproductive styles and practices of the married females (wives). About two-fifths (41.1%) of the females married at 18 years or less, and 80.8% married before their 25th birthday. A consanguineous marriage was a common practice (57.0%), where about one-third (33.1%) of the couples were first or second-degree cousins. The proportion of pregnant females among housewives during the study period was 9.3%. The prevalence of current usage of contraceptive method(s) was 28.9% (among those suitable for its use). Oral contraceptives (OCs) were the most dominant method (47.5%), followed by intrauterine devices (36.2%).

Table 2 shows that early marriage was significantly higher among females who obtained less than university education, compared to others (chi-square=20.17, $P<.0001$). Early female marriage was also higher among families with a low educational level of the husband, non-professional work status of both couples, and in

families with low income, but the differences were without statistical significance ($P>.05$)

Table 3 shows that about one-fourth (24.4%) of females aged less than 35 years were GMP which is significantly ($P<.001$) and much lower than the rate between older females (76.3%). GMP was significantly associated also with earlier marital age, low educational level of both parents and non-professional job status of the husband. This picture was reversed when relating the use of contraception to the study variables (**Table 4**). Contraceptive use was significantly associated with higher educational levels of husbands and wives, and with professional work status of wives ($P<.05$).

The total number of girls aged ≤ 18 years was 218, and 175 were reported to be circumcised; giving an 80.3%-point prevalence of circumcision. **Table 5** illustrates that 59.4% of girls were circumcised at the age of 7 years or less, and the second commonest age was at 18 years (35.4%). The majority of circumcisions were done by doctors (91.4%) or nurses (5.7%). However, relatives and traditional birth attendance (TBA) conducted FGM/C for 1.7% and 1.1% of girls, respectively. Complications associated with female circumcision were minimal, such as hemorrhage (2.9%) and fever (2.3%).

Table 2. Relationship between age of marriage of females and the study variables of married females in Hali.

	≤ 18 y (n=125) n (%)	> 18 y (n=177) n (%)	Chi-square	P	Odds ratio	CI
Husband education						
University & above	41 (35.0)	76 (65.0)	3.17	.1	.7	0.40-1.05
Less than university	84 (45.4)	101 (54.6)				
Wife education						
University & above	17 (21.0)	64 (79.0)	20.17	.001	.3	0.15-0.51
Less than university	108 (48.9)	113 (51.1)				
Husband occupation						
Professional	27 (38.6)	43 (61.4)	.30	.58	0.9	0.50-1.5
Non-professional	98 (42.2)	134 (57.8)				
Wife occupation						
Professional	6 (27.3)	16 (72.7)	1.95	.16	.51	0.19-1.34
Non-professional	119 (42.5)	161 (57.5)				
Income						
Enough	10 (37.0)	17 (63.0)	.23	.6	.82	0.36-1.9
Not enough	115(41.8)	160 (58.2)				

Table 6 shows that girls whose parents hold a university degree or above, and those with higher family income were reported to have a lower rate of circumcision compared to others. However, all these relationships were not statistically significant ($P>.05$). On the other hand, families with a history of consanguinity, and those with mothers married at younger age had a higher prevalence of circumcision of their daughters ($P>.05$).

DISCUSSION

To the best of our knowledge, and based on an extensive literature review, our study may be the first community-based study to assess female reproductive health and circumcision in the Hali semi-urban region of Saudi Arabia. Adverse effects of consanguinity can include reproductive wastage, higher morbidity and mortality,

genetic problems including rare autosomal recessive disorders, congenital malformations and inborn errors of metabolism.³ The overall prevalence of consanguinity was 57.0% (29.3% for the first-degree cousins and 27.7% for other relations). These results coincide with the findings of El-Mouzan, et al¹⁴ who conducted an older study (2007) in 13 regions of Saudi Arabia and reported that the prevalence of consanguinity was 56% (33.6% for the first-degree cousins and 22.4% for other relations). On the other hand, these rates are higher than rates reported from Jeddah (34.6%)¹⁵ and Riyadh (29.7% for first and second cousins).³ These variations can be related to the differences between study settings and the effect of urbanization.³

Early marriage is usually affected by social norms, family beliefs and traditions.¹⁶ The current study revealed that 41.4% of female married at an early age

Table 3. Relationship between grand multiparity and the study variables among married females who were ever pregnant in Hali (n=296).

	Yes (n=162) n (%)	No (n=134) n (%)	Chi-square	P	Odds ratio	CI
Age of wife						
<35 years	30 (24.4)	93 (75.6)	78.2	.001	.10	0.05-0.2
≥35 years	132 (76.3)	41 (23.7)				
Age of wife at marriage						
≤18 years	89 (72.4)	34 (27.6)	25.2	.001	3.6	2.18-5.9
>18 years	73(42.2)	100 (57.8)				
Husband education						
University & above	50 (43.1)	66 (56.9)	10.41	.001	.5	0.29-0.5
Less than university	112 (62.2)	68 (37.8)				
Wife education						
University & above	26 (32.5)	54 (67.5)	21.9	.001	.3	0.17-0.5
Less than university	136 (63.0)	80 (37.0)				
Husband occupation						
Professional	29 (41.4)	41(58.6)	6.6	.01	.5	0.29-0.9
Non-professional	133 (58.8)	93 (41.2)				
Wife occupation						
Professional	10 (45.5)	12 (54.5)	.83	.4	.7	0.28-1.60
Non-professional	152 (55.5)	122 (44.5)				
Income						
Enough	14 (48.3)	15 (51.7)	.54	.5	.8	0.35-1.61
Not enough	148 (55.4)	119 (44.6)				

Table 4. Relationship between usage of contraceptive methods and the study variables in Hali region.

	Yes (N=80) N (%)	No (N=197) N (%)	Chi-square	P	Odds ratio	CI
Husband education						
University & above	41 (37.3)	69 (62.7)	6.3	.01	1.95	1.15-3.30
Less than university	39 (23.4)	128 (76.6)				
Wife education						
University & above	34 (43.0)	45 (57.0)	10.8	.001	2.50	1.43-4.4
Less than university	46 (23.2)	152 (76.8)				
Husband occupation						
Professional	22 (34.4)	42 (65.6)	1.22	.27	1.40	.77-2.54
Non-professional	58 (27.2)	155 (72.8)				
Wife occupation						
Professional	11 (50.0)	11 (50.0)	5.2	.02	2.70	1.11-6.50
Non-professional	69 (27.1)	186 (72.9)				
Income						
Enough	9 (34.6)	17 (65.4)	0.5	.49	1.34	.57-3.2
Not enough	71 (28.3)	180 (71.7)				

Table 5. Characteristics of circumcised girls aged 18 years or less in Hali region.

Characteristics	n (%)
Age at circumcision	
7 or less	104 (59.4)
8-10	1 (0.6)
11-14	5 (2.9)
15-17	3 (1.7)
18	62 (35.4)
Who conducted circumcision	
Doctor	160 (91.4)
Nurse	10 (5.7)
Relatives	3 (1.7)
Traditional Birth Attendant (DAYA)	2 (1.1)
Complications	
No complication	166 (94.8)
Complications	9 (5.2)
Total	175 (100.0)
Complication	
Haemorrhage	5 (2.9)
Fever	4 (2.3)

(≤ 18 years) and this was associated with low educational levels. This relatively high rate can be explained by the norm of an early marriage pattern in such a semi-urban region. However, this rate is much better than an older rate of 82% from the 1995 nationwide maternal study, when the female literacy rate was as low as 38%.² This discrepancy between both studies may be due to much improvement in female education in Saudi Arabia.

In many nations, GMP is associated with higher risks of obstetric complications such as gestational diabetes, hypertension, maternal anemia, obstructed labor, postpartum hemorrhage, congenital malformations and perinatal mortality.^{4,5} High parity is a common characteristic in rural communities, and this pattern is affected mostly by the socioeconomic and educational status of parents. Large families are highly valuable in these communities.⁴ Our study reported that the prevalence of GMP was 54.7%, and it was associated with early marriage. The rate in this study is much higher than the rates reported from two recent Saudi studies done in tertiary hospitals from Riyadh⁴ (10.2%) and Buraidah, Al Qassim (5.3%).¹⁷ These discrepancies may be related to the differences between the study settings, and the levels of urbanization. Increased use of family planning methods may be another reason for the difference between our study and that of Buraidah.⁴

Table 6. Relationship between circumcision of girls and other study variables in Hali.

	Yes (n=175) N (%)	No (n=43) N (%)	Chi-square	P	Odds ratio	95% CI
Father education						
University & above	60 (75.0)	20 (25.0)	2.22	.13	600.	0.31-1.18
Less than university	115 (83.3)	23 (16.7)				
Mother education						
University & above	40 (72.7)	15 (27.3)	2.65	10.	553.	0.27-1.14
Less than university	135 (82.8)	28 (17.2)				
Father occupation						
Professional	39 (81.2)	9 (18.8)	03.	5.	1.08	0.48-2.45
Non-professional	136 (80.0)	34 (20.0)				
Mother occupation						
Professional	14 (87.5)	2 (12.5)	.57*	5.	1.8	0.39-8.16
Non-professional	161 (79.7)	41 (20.3)				
Income						
Enough or more	17 (68.0)	8 (32.0)	2.7	10.	5.	0.19-1.18
Not enough	158 (81.9)	35 (18.1)				
Consanguinity in family						
Yes	108 (83.7)	21 (16.3)	2.4	12.	1.7	0.86-3.30
No	67 (75.3)	22 (24.7)				
Age of mother at marriage						
<18 years	32 (88.9)	4 (11.1)	1.74*	2.	2.08	0.69-6.29
≥18 years	127 (79.4)	33 (20.6)				

*: Fisher's exact test

Furthermore, about one-fourth of grand multiparas in our survey aged <35 years and this coincides with the results from Buraidah,¹⁷ which agrees with the concept of "younger GMP".¹⁷ Furthermore, our study reported that GPM was associated with early marriage which was also suggested by Alsammani, et al¹⁷ GMP was also associated in our study with low educational level of both parents and non-professional occupational status of the husband. These findings are in line with the results from Riyadh.⁴

The present study demonstrated a pattern of little use of contraceptive methods (28.9%). However, a lower rate of contraceptive usage than that of the current study has been documented from Yemen and Djibouti (19.2% and 17.1% respectively). On the other hand,

Egypt (57.6%), Morocco (54.8%) and Tunisia (50.0%),¹⁸ and Qatar (47.8%)⁶ reported higher rates. Furthermore, the prevalence of contraceptive use from North America was much higher (76.56%).¹⁸ In the present survey, the use of contraceptives was associated with a low education level of parents which is in line with the findings noted from Qatar.⁶ The most frequently used contraceptives in the current study were oral medications followed by IUDs. However, results from Qatar showed that IUDs was the commonest method followed by oral.⁶

Our finding of over 80% prevalence of circumcision practice among girls aged ≤18 years may confirm that the practice is still rooted in the culture of people in the rural and semi-urban areas. Female circumcision is

a social practice that is strongly anchored in cultural beliefs and norms.¹⁹ Nevertheless, the rate reported from the current study is not far from figures reported among adolescent Egyptian females, which was 88% in 2014.⁷ Our results also agree with results from other African countries. The prevalence of circumcision among women aged 14-49 years from a recent study (2018) in Sudan was 89%.²⁰ On the other hand, higher rates were reported from Djibouti (93%) and Somalia (98%).²¹

Female circumcision can cause many health risks.^{22,23} Immediate and long-term complications such as shock, sepsis, urine retention, tetanus, infertility, childbirth complications and newborn deaths can occur.²³ In the current study, most of fathers (94%) reported an absence of complications associated with FGM/C, which may be attributed to medical personnel doing most of the operations. This result contradicts findings from many studies in African and Arab countries, which indicate a high rate of circumcision done by local healers and TBA.²²

The finding of early age of circumcision in our study (about 60% of circumcision was done at ≤ 7 years) is in line with the practice from other countries. Female circumcision is performed as early as infancy for some girls in some African countries and Yemen.¹⁰ Nevertheless, in the current study many of the circumcisions (35.4%) were done at the age of 18 years: during adolescence and at the time of marriage age. This is perceived as an enhancement of the value of the female.²² In the current study, girls whose mothers were less-educated, and

those with a lower family income had a higher prevalence of circumcision compared to others ($P > .05$). This higher rate among the less educated is in line with a recent study from Ethiopia.²³

In conclusion, the reproductive lifestyle in Hali is affected by socio-economic and educational factors. Consanguinity is still a common practice in Hali. High parity is still found and is related to maternal age, early marriage, low educational levels of both parents, and non-professional occupations of the husbands. The prevalence of circumcision was still relatively high among girls. The most common age of circumcision was ≤ 7 years. Most circumcision was done by doctors. Hemorrhage and fever were the problems recorded with circumcision, but only among a small percentage of girls. Formulation of legislation to prohibit early marriage and circumcision is recommended. Proper awareness of the dangers of such practices with professional guidance is suggested. Messages can reach important groups through schools, mosques, social gatherings, and social media.

Acknowledgments

Authors would like to thank Zam Zam Non-Profit Organization for funding the project. We would like to thank all officials who facilitated the study, all health teams and all participants in the study from Hali region. Special thanks to Dr Nusaybah Albar, Dr. Ghazal Mirdad, Dr. Najim Zafer and Ms. Lamis Milaat for their efforts in the study.

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