

Decline of Supportive Attitudes among Husbands toward Female Genital Mutilation and Its Association to Those Practices in Yemen

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Abstract

Objectives: To elucidate the attitudes of women and their husband's towards female genital mutilation (FGM) and their associations with the continuation of FGM upon their daughters.

Methods: Subjects were 10,345 (in 1997) and 11,252 (in 2003) ever married women aged 15 to 49 years from the Yemen Demographic Health Surveys. Performances of FGM on the most-recently-born daughters were investigated. Attitudes of women and their husbands were assessed by their opinions on the continuation of FGM. The association between the attitudes of women and their husbands and performance of FGM on the most-recently-born daughters were investigated after adjusting for age and education of the women.

Findings: The percentage among the most-recently-born daughters who received FGM of women who had undergone FGM declined from 61.9% in 1997 to 56.5% in 2003 ($p < 0.001$). The percentages of women who had undergone FGM and who supported the continuation of FGM and of husbands who also supported its continuation decreased from 78.2% and 60.1% in 1997 to 70.9% and 49.5% in 2003, respectively (both $p < 0.001$). When the women or the husbands did not agree with FGM, it was less likely to be performed on their daughter than when the women or the husbands agreed in 1997 (odds ratio=0.11, 95% confidence interval 0.07-0.16 and odds ratio=0.07, 95% confidence interval 0.04-0.12, respectively) and in 2003 (odds ratio=0.12, 95% confidence interval 0.09-0.16 and odds ratio=0.11, 95% confidence interval 0.07-0.16, respectively).

Conclusion: Non-supportive attitudes of women and their husbands towards the continuation of FGM have become common and were associated with their decision not to perform FGM upon their daughters.

Citation: Al-Khulaidi GA, Nakamura K, Seino K, Kizuki M (2013) Decline of Supportive Attitudes among Husbands toward Female Genital Mutilation and Its Association to Those Practices in Yemen. PLoS ONE 8(12): e83140. doi:10.1371/journal.pone.0083140

Editor: Thomas Behrens, Universität Bochum, Germany

Received: August 16, 2013; **Accepted:** October 29, 2013; **Published:** December 18, 2013

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Funding: The authors have no support or funding to report.

Competing interests: The authors have declared that no competing interests exist.

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Introduction

Female genital mutilation (FGM) comprises all procedures involving partial or total removal of the external female genitalia or other intentional injuries to the female genital organs for non-medical reasons. FGM is also known as female circumcision and female genital cutting. About 140 million girls and women worldwide are estimated to be living with the consequences of FGM, and more than 2 million girls are suggested to be at risk of undergoing the procedures every year [1,2].

The World Health Organization (WHO) reported that women who have had FGM are significantly more likely to experience difficulties during childbirth, and their babies are more likely to die as a result of the practice [1,3,4]. Immediate health risks of FGM include severe pain, shock, excessive bleeding, difficulty

in passing urine, infection, Human Immunodeficiency Virus (HIV), death, psychological consequences, unintended labial fusion, and repeated FGM. Long-term consequences include pain, infection, keloid, HIV, reproductive tract infections and sexually transmitted infections, birth complication, danger to the new-born, psychological consequences, quality of sexual life, infertility, later surgery, painful sexual intercourse, and urinary and menstrual problems [5]. Moreover, FGM is usually performed by non-professionals who do not even know the anatomy of the female genitalia [3,4].

Every major international health and rights consensus document of the last decade condemns FGM, and the Programme of Action of the International Conference on Population and Development (ICPD) calls on governments "to prohibit female genital mutilation wherever it exists and to give

vigorous support to efforts among nongovernmental and community organizations and religious institutions to eliminate such practices” (paragraph 4.22) [1,5]. In 2008, the World Health Assembly adopted resolution WHA61.16 on the elimination of FGM, in which all member states agreed to work towards the abandonment of FGM, including ensuring that the procedure is not performed by health professionals [6].

The prevailing reasons for FGM are complex and numerous, and include the sociological (initiation of girls into womanhood), social integration and the maintenance of social cohesion; hygienic and aesthetic (belief that the female genitalia are dirty and unsightly); sexual (control or reduction of female sexuality); health (belief that it enhances fertility and child survival); religious (belief that it is a religious requirement); socio-economic factors (belief that FGM is a prerequisite for marriage, and where women are largely dependent on men, economic necessity can be a determinant for undergoing the procedure, and the practice can also be a major source of income for circumcisers); migration and displacement [7,8].

A woman’s attitude towards FGM—is very much related to her status as a woman within her community [9]. According to Maja and Litt, men are often left out of the picture when decisions about reproductive health issues are discussed, and male involvement in reproductive health should be mainstreamed in all major thrusts of the strategic framework, and men of all ages must be educated about responsible sexual behaviour [10].

FGM is performed in every social stratum, among both rich and poor, undereducated and highly educated, and both in cities and the countryside [11]. Countries may pass laws to eradicate FGM, but legal instruments by themselves cannot end the practice due to strong and deeply rooted traditions and beliefs in societies [12].

This study aims to highlight the attitudes of women of reproductive age (15–49 years old) and their husbands towards the practice of FGM, as well as their association with the performance of FGM upon their daughters. This is one of the first studies using Demographic Health Survey (DHS) data to show practice of FGM in Yemen from 1997 to 2003.

Methods

Ethics statement

Not applicable.

Data source

The DHS programme was designed as a follow-up to the World Fertility Survey and the Contraceptive Prevalence Survey projects. The programme has been implemented in overlapping five-year phases. In Yemen, the survey was implemented by the Central Statistical Organisation/Ministry of Planning & International Cooperation in 1997 and by the Ministry of Public Health and Population and the Central Statistical Organisation/Ministry of Planning & International Cooperation, under the supervision of the Arab Family Health Survey in 2003. Permission to use Yemen’s DHS data from 1997 and 2003 for the analysis of health status of women and related conditions was provided by the Yemen Central

Statistical Organisation/Ministry of Planning & International Cooperation.

Sampling

The DHS was designed on the basis of the multi-stage sampling in order to provide estimates for general indicators for Yemen as a whole, for urban areas, and for rural areas. Islands were excluded from a sampling frame because of the small sizes of their populations and the difficulty in accessing them [13,14].

The data we extracted from the DHS database for the present analysis were 10,345 and 11,252 women of reproductive age (aged 15–49) who had ever married, in 1997 and 2003 respectively.

Measures and procedure

We collected information about characteristics of women (age and education) and FGM (if they had ever heard about FGM). The questions related to FGM were asked only of women who had heard of FGM. For women who reported that they had ever heard about FGM, further questions were asked about women and their husband’s attitudes toward FGM, and if they had performed FGM on their most-recently-born daughters. The attitudes were assessed by asking respondents their opinions and their perceptions of their husband’s opinions on the continuation of FGM. The response alternatives for this query were “practice should be continued”, “practice should be stopped”, “don’t know”, and the additional alternative “attitude not clear” only for the husbands attitude.

The variables of age, education, having heard of FGM, having ever undergone FGM, the performance of FGM on the most-recently-born daughter, the respondent’s attitude, and husband’s attitude towards FGM were used for the analysis. In addition where FGM took place, who performed the FGM, and the age of the most-recently-born daughter when she received FGM were reported.

Statistical analysis

The percentage of performance of FGM on the most-recently-born daughters and attitudes of women and their husbands toward FGM were compared between 1997 and 2003 by using chi-square test.

Logistic regression analyses were applied to investigate the association of attitudes of women and their husbands towards FGM and performance of FGM on the most-recently-born daughters among women who had undergone FGM and women who hadn’t undergone FGM separately. The independent variables were age and education of women and women’s and husband’s attitudes towards the continuation of FGM. These analyses were done separately for 1997 and 2003.

To investigate independent association of the year of survey on performance of FGM on the most-recently-born daughters, another logistic regression model was applied after pooling data from two survey years.

Sample weight was applied to correct disproportional sampling probabilities and to adjust the collected data to represent the population from which the sample was drawn.

Incomplete data on FGM related and other variables were excluded from the analyses. The level of statistical significance for all analysis was set at $\alpha=0.05$. All statistical analyses were performed with SPSS version 18.

Results

Table 1 shows the distribution of demographic variables and FGM related variables in 1997 and 2003. The percentage of illiterate women was lower in 2003 than in 1997 ($p<0.001$). The percentage of women who had heard of FGM was higher in 2003 than in 1997 ($p<0.001$). The percentage of most-recently-born daughters who received FGM was 29.3% in 1997 and 22.4% in 2003, and significantly lower in 2003 than in 1997 ($p<0.001$). More women and more of their husbands thought that FGM practice should be stopped in 2003 than in 1997 (both $p<0.001$). The percentage of couples that both agreed that the FGM practice should be continued was reduced from 27.5% in 1997 to 19.6% in 2003 ($p<0.001$).

The DHS data showed that FGM was performed on the most-recently-born daughter mainly within the first month after birth (92.8% in 1997 and 81.1% in 2003), and at home (96.9% in 1997 and 94.8% in 2003). In 71.4% of the cases, FGM was performed by a traditional birth attendance (daya or Kharshofa) in 1997; and this percentage dropped to 59.8% in 2003.

Table 2 shows FGM practice on most-recently-born daughters and the attitudes of women and their husbands for women who had undergone FGM and for women who had not. Women who had undergone FGM were more likely to perform FGM on their daughters (61.9% in 1997 and 56.5% in 2003, $p<0.001$) and were more likely to be supportive of FGM continuation (78.2% and 70.9%, $p<0.001$) than women who had not. Husbands of women who had undergone FGM were supportive of FGM continuation (60.1% and 49.5%, $p<0.001$). Both the women and their husbands were more supportive regarding performance of FGM when the women had not undergone FGM (57.5% and 47.4%, $p<0.001$).

Table 3 shows the adjusted association of women and their husband's attitude towards FGM with FGM being performed on the most-recently-born daughter among women who undergone FGM in 1997 and 2003, separately. When women did not agree with FGM, daughters were less likely to receive FGM in 1997 (odds ratio 0.11, 95% confidence interval 0.07-0.16) and in 2003 (odds ratio 0.12, 95% confidence interval 0.09-0.16). When husbands did not agree with FGM, daughters were less likely to receive FGM in 1997 (odds ratio 0.07, 95% confidence interval 0.04-0.12) and in 2003 (odds ratio 0.11, 95% confidence interval 0.06-0.17).

Table 4 shows the adjusted association of women and their husband's attitude toward FGM with FGM being performed on the most-recently-born daughter among women who hadn't undergone FGM in 1997 and 2003, separately. When women did not agree with FGM, daughters were less likely to receive FGM in 1997 (odds ratio 0.13, 95% confidence interval 0.07-0.23) and in 2003 (odds ratio 0.14, 95% confidence interval 0.06-0.33). When husbands did not agree with FGM, daughters were less likely to receive FGM in 1997 (odds ratio

0.14, 95% confidence interval 0.06-0.31) and in 2003 (odds ratio 0.12, 95% confidence interval 0.04-0.38).

Table 5 shows the adjusted differences in the performance of FGM on the most-recently-born daughter between survey years after combining 1997 and 2003 data of women's experience in having undergone FGM. Daughters were less likely to receive FGM in 2003 than in 1997 among women who had undergone FGM (odds ratio 0.72, 95% confidence interval 0.58–0.88) after adjustment for age and education of women and attitudes of women and their husbands. Moreover, the odds ratio for performance of FGM on the most-recently-born daughter among women who hadn't undergone FGM showed further decline of FGM on daughters from 1997 to 2003 (odds ratio 0.53, 95% confidence interval 0.36–0.80).

Discussion

The results showed that frequency of FGM on daughters has declined from 1997 to 2003. During this period, the awareness of FGM practice has increased among women. Women who undergone FGM were more likely to have it performed on their daughters. Women's and husbands' attitudes not supportive to the continuation of FGM was significantly associated with not having performed FGM on their daughters regardless of women's age and education.

There was a decline in the FGM supportive attitudes and practice in the population from 1997 to 2003. The reduction in practice over the years was partly explained by the changes of women's and their husbands' attitudes towards FGM, and improvement in education among women from 1997 to 2003. The changes in attitudes of women and their husbands could be due to the ministerial decree prohibiting health providers from performing FGM in Yemen. This ministerial decree was a result of the Clinical-Based Investigation of Female Genital Mutilation in Selected Areas of Yemen in 1999 by different government entities. However, health officials mentioned that the decree's effectiveness couldn't be monitored in all medical facilities [3]. Recent exposure by the population to the information from health providers, media, and health projects that help in raising awareness on health issues, including FGM could also have contributed to the change of attitudes of people in Yemen towards FGM. Literate women were less likely to perform FGM on their daughters than illiterate women. Access to education can help end FGM because there is a significant relationship between education and FGM. The attitude of the illiterate women was more supportive towards FGM than that of literate women. It was reported that the more educated the mothers are, the less likely they are to have their daughters circumcised [15]. Education in the case of FGM is seen as a source of empowerment for women because it can facilitate their abilities to gather and assimilate information [16]; this point agrees with other studies that the practice of FGM and support for its discontinuation by women changes with education and awareness.

This study showed that the attitudes of husbands are also important. A daughter is more likely to receive FGM when the attitude towards FGM of her father is positive. The roles of women's attitudes to FGM in decision making are complex and

Table 1. Age and education of women and attitude and practice related with female genital mutilation (FGM) in Yemen, 1997 and 2003.

	1997		2003		p
	n*	%	n*	%	
Among all women aged 15-49					
Total	10345	100.0	11252	100.0	
Age					<0.001
15-19	1101	10.6	865	7.7	
20-24	1986	19.2	2206	19.6	
25-29	1927	18.6	2198	19.5	
30-34	1669	16.1	1681	14.9	
35-39	1757	17.0	1813	16.1	
40-44	1083	10.5	1389	12.3	
45-49	822	7.9	1099	9.8	
Education					<0.001
Illiterate	8429	81.5	8688	77.2	
Literate	1916	18.5	2564	22.8	
Women have heard about FGM					
Yes	5226	50.5	6301	56.0	<0.001
No	5119	49.5	4951	44.0	
Among women aged 15-49 who ever heard of FGM					
Total	5226	100.0	6302	100.0	
Women have undergone FGM					
Yes	2335	44.7	2420	38.4	<0.001
No	2891	55.3	3882	61.6	
Most-recently-born daughter undergone FGM					
Yes	1530	29.3	1413	22.4	<0.001
No	2449	46.9	3452	54.8	
No daughters	1247	23.9	1436	22.8	
Women's attitude towards FGM					
Practice should be continued	2143	41.0	2034	32.3	<0.001
Practice should be stopped	2502	47.9	3426	54.4	
Do not know	581	11.1	842	13.4	
Husband's attitude towards FGM					
Practice should be continued	1557	29.8	1332	21.1	<0.001
Practice should be stopped	1030	19.7	1375	21.8	
Attitude not clear	113	2.2	167	2.6	
Do not know	2197	42.0	3034	48.2	
No husband	330	6.3	394	6.2	
Woman's and husband's attitude towards FGM					
Both agree	1437	27.5	1233	19.6	<0.001
Husbands disagree and women agree	77	1.5	115	1.8	
Husbands agree and women disagree	80	1.5	67	1.1	
Both disagree	912	17.4	1208	19.2	
Do not know	2442	46.7	3344	53.1	
No husband	278	5.3	335	5.3	
Among most-recently-born daughter who underwent FGM					
Total	1530	100.0	1413	100.0	
Age when FGM was performed[#]					
≥ birth, < 1 month	1091	92.8	1091	81.1	<0.001
≥ 1 month, < 1 year	76	6.5	250	18.6	
≥ 1 year	8	0.7	4	0.3	
Other	1	0.1	0	0.0	
Location where FGM took place[#]					
At home	1140	96.9	1277	94.8	<0.001
Health facility	37	3.1	54	4.0	

Table 1 (continued).

	1997		2003		p
	n*	%	n*	%	
Other	0	0.0	17	1.3	
Person performing FGM[#]					<0.001
Health provider	112	9.6	155	11.5	
Traditional birth attendant	841	71.4	805	59.8	
Traditional healer	177	15.0	203	15.1	
Barber	42	3.6	142	10.6	
Other	5	0.4	42	3.1	

p-values were calculated with chi-square tests.

* After sampling weights were applied, numbers were rounded.

[#] Due to missing cases, the sum number of cases by categories are not equal to the total number of cases.

doi: 10.1371/journal.pone.0083140.t001

Table 2. FGM practice on most-recently-born daughter and attitudes towards FGM of women and their husbands for women who had undergone FGM and women who had not.

	1997				p	2003				p
	Women had undergone FGM					Women had undergone FGM				
	Yes		No			Yes		No		
	n	%	n	%	n	%	n	%		
Most-recently-born daughter underwent FGM					<0.001					<0.001
Yes	1445	61.9	85	2.9	1366	56.5	47	1.2		
No	321	13.7	2128	73.6	512	21.2	2940	75.7		
No daughters	569	24.4	678	23.5	541	22.4	895	23.1		
Women's attitude towards FGM					<0.001					<0.001
Practice should be continued	1827	78.2	316	10.9	1715	70.9	319	8.2		
Practice should be stopped	387	16.6	2115	73.2	547	22.6	2879	74.2		
Do not know	121	5.2	460	15.9	159	6.6	683	17.6		
Husbands' attitude towards FGM					<0.001					<0.001
Practice should be continued	1403	60.1	154	5.3	1199	49.5	133	3.4		
Practice should be stopped	212	9.1	818	28.3	341	14.1	1034	26.6		
Attitude not clear	54	2.3	59	2.0	67	2.8	100	2.6		
Do not know	530	22.7	1667	57.6	657	27.1	2378	61.3		
No husband	136	5.8	194	6.7	157	6.5	237	6.1		
Woman's and husband's attitude towards FGM					<0.001					<0.001
Both agree	1342	57.5	96	3.3	1147	47.4	86	2.2		
Husbands disagree and women agree	40	1.7	37	1.3	79	3.3	35	0.9		
Husbands agree and women disagree	35	1.5	45	1.6	36	1.5	31	0.8		
Both disagree	163	7.0	748	25.9	252	10.4	957	24.6		
Do not know	630	27.0	1812	62.6	761	31.4	2583	66.5		
No husband	125	5.3	154	5.3	146	6.0	189	4.9		

doi: 10.1371/journal.pone.0083140.t002

differ based on the society. It is possible in some societies that women who think that FGM should be stopped should ensure that their own daughters undergo the procedure against their wish due to pressure from family and society. Yemen is a traditional society in which prevailing cultural attitudes bestow low status upon women in the family as well as in the community, and men are dominant [17–19]. Insufficient attention had been paid to men's attitudes.

Men's positive attitude towards FGM has declined. In 1998, WHO emphasized that males should be empowered through the provision of information and services targeting boys, youth, and adults within the home, community, and work setting [10,17,20,21]. In the past, men's involvement has sometimes been opposed by women's health advocates, who understandably fear that adding these services will damage the quality of women's services and create additional competition for already scarce resources [11]. Since men were excluded

Table 3. Associations of age and education of women, woman's and husband's attitude towards female genital mutilation (FGM), and FGM performance on most-recently-born daughter among women who undergone FGM in Yemen in 1997 and 2003.

	1997 (n=2335)					2003 (n=2420)				
	FGM on most-recently-born daughter	Adjusted OR	95%CI		p	FGM on most-recently-born daughter	Adjusted OR	95%CI		p
			Lower limit	Upper limit				Lower limit	Upper limit	
%					%					
Age										
15-19	81.1	1.21	0.45	3.25	0.701	78.2	1.02	0.33	3.17	0.969
20-24	75.8	0.53	0.27	1.04	0.066	71.0	0.81	0.47	1.37	0.423
25-29	82.6	1.04	0.54	2.02	0.897	72.4	0.88	0.54	1.44	0.621
30-34	81.5	1.09	0.58	2.05	0.792	74.1	0.88	0.54	1.44	0.619
35-39	83.4	0.81	0.43	1.53	0.515	71.5	0.87	0.55	1.40	0.572
40-44	83.6	1.06	0.54	2.08	0.863	72.1	0.80	0.49	1.30	0.367
45-49	83.3	reference				75.0	reference			
Education										
Illiterate	84.5	reference				73.9	reference			
Literate	68.2	0.40	0.26	0.61	<0.001	67.9	0.99	0.71	1.37	0.936
Woman's attitude toward FGM										
Practice should be continued	94.1	reference				89.0	reference			
Practice should be stopped	35.2	0.11	0.07	0.16	<0.001	26.8	0.12	0.09	0.16	<0.001
Do not know	59.2	0.20	0.12	0.34	<0.001	57.8	0.33	0.21	0.52	<0.001
Husband's attitude toward FGM										
Practice should be continued	96.7	reference				92.6	reference			
Practice should be stopped	30.2	0.07	0.04	0.12	<0.001	26.9	0.11	0.07	0.16	<0.001
Attitude not clear	76.7	0.36	0.14	0.90	0.029	65.5	0.29	0.15	0.55	<0.001
Do not know	61.1	0.12	0.08	0.18	<0.001	58.5	0.25	0.18	0.36	<0.001
No husband	82.8	0.27	0.13	0.54	<0.001	69.5	0.38	0.22	0.66	<0.001

Adjusted odds ratios (ORs) were estimated using multivariable logistic regression analysis. The model included all variables in this table as independent variables.

doi: 10.1371/journal.pone.0083140.t003

most of the time from women's reproductive health education and programmes, this could explain the lack of resources related to men attitude towards women's reproductive health. Now, programmes on health education and women's reproductive health include both the women and men.

Most FGM was performed at home by a traditional birth attendant and not a trained health provider. The practice depends on the community or individual family [7] and girls are not aware that they have been circumcised until they get married or have been examined. The practice at homes by a traditional birth attendant involves the use of unsterilized tools

and instruments and the location could endanger the child's life because it could be far from a health facility [1].

FGM is performed in early age of a girl's life. The analysis of the DHS revealed that most of the practice of FGM in Yemen was performed within the first month after birth. This could be due to tradition and it could be to avoid pain. The daughters might not remember the immediate consequences or even did not know if she had been circumcised, but long-term risks will be faced by the girl when she grows up and get married. According to WHO, FGM involves removing and damaging healthy and normal female genital tissue, and interferes with

Table 4. Associations of age and education of women, woman's and husband's attitude towards female genital mutilation (FGM), and FGM performance on most-recently-born daughter among women who hadn't undergone FGM in Yemen in 1997 and 2003.

	1997 (n= 2892)					2003 (n=3882)				
	FGM on most-recently-born daughter	Adjusted OR	95%CI		p	FGM on most-recently-born daughter	Adjusted OR	95%CI		p
			%	Lower limit				Upper limit	%	
Age										
15-19	4.9	2.72	0.64	11.55	0.176	2.6	2.02	0.30	13.77	0.474
20-24	2.1	0.47	0.16	1.44	0.187	1.7	1.34	0.40	4.50	0.638
25-29	3.8	1.00	0.40	2.48	0.999	1.4	0.89	0.27	2.88	0.842
30-34	2.9	0.69	0.26	1.81	0.450	1.8	0.86	0.27	2.70	0.797
35-39	6.2	1.32	0.57	3.05	0.518	1.6	0.68	0.21	2.19	0.521
40-44	2.2	0.50	0.16	1.62	0.251	1.3	0.41	0.11	1.51	0.181
45-49	5.2	reference				1.6	reference			
Education										
Illiterate	4.4	reference				1.9	reference			
Literate	2.0	0.59	0.28	1.27	0.177	0.7	0.32	0.12	0.83	0.019
Woman's attitude toward FGM										
Practice should be continued	22.8	reference				10.8	reference			
Practice should be stopped	1.5	0.13	0.07	0.23	<0.001	0.7	0.14	0.06	0.33	<0.001
Do not know	2.2	0.20	0.08	0.46	<0.001	1.0	0.16	0.06	0.47	0.001
Husband's attitude toward FGM										
Practice should be continued	33.5	reference				18.9	reference			
Practice should be stopped	2.0	0.14	0.06	0.31	<0.001	0.7	0.12	0.04	0.38	<0.001
Attitude not clear	13.4	0.51	0.19	1.37	0.180	4.8	0.66	0.19	2.25	0.502
Do not know	1.0	0.06	0.03	0.12	<0.001	0.9	0.11	0.05	0.26	<0.001
No husband	7.9	0.43	0.19	0.97	0.043	0.6	0.08	0.01	0.61	0.015

Adjusted odds ratios (ORs) were estimated using multivariable logistic regression analysis. The model included all variables in this table as independent variables.

doi: 10.1371/journal.pone.0083140.t004

the natural functions of girls' and women's bodies [1]. Women's health is affected by their capacity to conceive, and this includes the risk of disorders associated with reproductive organs [22]. It was reported that pregnant women who had undergone FGM had risks at obstructed labour, which result in uterine rupture, with severe, often fatal bleeding, or postpartum vesical or rectal fistula [23].

There is a complex interplay between women and husbands attitudes [24]. Our analyses tease out the association of husbands' attitudes with performance of FGM on daughters while controlling for wives' attitudes.

This study measures the attitudes of husbands as perceived by their wives. There is a concern that the norms of women reflect social norms rather than the actual attitude of their husbands. However, in this study the likelihood of this was low because the women were given the options to answer "don't know" or "not clear". Therefore, the question on their husband's attitudes did indeed measure it.

Yemen is one of the developing countries selected as a pilot for the Millennium Development Goal (MDG) project. Yet, the country had concerns about achieving the MDG5 (improving maternal health) because of widely practiced FGM which has consequences of infection, pain, and trauma leading to

Table 5. Reduction of performance of female genital mutilation (FGM) on most-recently-born daughter in Yemen from 1997 to 2003* adjusted for agreement and education of women, by women's experience in having undergone FGM.

	Adjusted OR	95%CI		p
		Lower limit	Upper limit	
FGM on most-recently-born daughter among women who had undergone FGM (n=4755)				
Year				
1997	reference			
2003	0.72	0.58	0.88	0.001
Age				
15-19	1.40	0.69	2.83	0.353
20-24	0.68	0.46	1.02	0.060
25-29	0.92	0.63	1.33	0.642
30-34	0.94	0.65	1.36	0.734
35-39	0.89	0.62	1.28	0.534
40-44	0.91	0.62	1.34	0.624
45-49	reference			
Education				
Illiterate	reference			
Literate	0.69	0.54	0.89	0.004
Woman's and husband's attitude towards FGM				
Both agree	reference			
Husbands disagree and women agree	0.03	0.02	0.05	<0.001
Husbands agree and women disagree	0.13	0.07	0.23	<0.001
Both disagree	0.02	0.01	0.02	<0.001
Do not know	0.07	0.06	0.10	<0.001
FGM on most-recently-born daughter among women who hadn't undergo FGM (n=6774)				
Year				
1997	reference			
2003	0.53	0.36	0.80	0.002
Age				
15-19	2.08	0.68	6.39	0.203
20-24	0.71	0.31	1.61	0.409
25-29	0.83	0.39	1.75	0.622
30-34	0.74	0.35	1.57	0.431
35-39	0.95	0.47	1.93	0.892
40-44	0.48	0.20	1.16	0.103
45-49	reference			
Education				
Illiterate	reference			
Literate	0.48	0.27	0.87	0.015
Woman's and husband's attitude towards FGM				
Both agree	reference			
Husbands disagree and women agree	0.19	0.07	0.53	0.002
Husbands agree and women disagree	0.26	0.11	0.62	0.002
Both disagree	0.02	0.01	0.04	<0.001
Do not know	0.03	0.02	0.04	<0.001

* Reduction was shown as odds ratios (ORs) for year comparing 2003 with 1997.

doi: 10.1371/journal.pone.0083140.t005

negative health impacts. The health complications lead by FGM are associated with pregnancy, childbirth and the postpartum, which makes childbirth painful and dangerous as it prolongs labour, obstructs the birth canal and often causes perianal tears [25,26].

As a follow-up to the International Conference on Population and Development (ICPD), which states that governments are

urged to prohibit female genital mutilation and to prevent infanticide [27], Yemen's Ministry of Public Health and Population (MoPHP) drafted a law to prohibit female genital mutilation by anyone, including health providers in 2008. However, the law was not passed by parliament and challenged by questions raised by religious leaders in the Ministry of Endowment about the actual health consequences

of FGM. Meantime in 2012, the MoPHP again drafted a law to prohibit female genital mutilation; in addition to educational and awareness programs on FGM by Yemeni government and partners for targeted population that started from 1999.

ICPD also addressed sexual and reproductive health issues under chapter VII (Reproductive Rights and Reproductive Health) [27]. Studies and reviews confirm the need for sexual and reproductive health awareness and education for both men and women [28–30]. Therefore, there is a need for sexual and reproductive health education inducting the health risks from FGM at the community, school, and university levels. Men and boys should be included in measures addressing women's health because they play a very important role in decision making.

In conclusion, non-supportive attitudes by women and their husbands towards the practice of FGM influenced their decisions to abstain from having FGM performed upon their daughters. Significant factors in the decline in performance of

FGM were changes in women's and their husband's attitudes towards FGM, and improved education of women.

Acknowledgements

We would like to thank Yemen Central Statistical Organisation/ Ministry of Planning & International Cooperation, Ministry of Public Health and Population and Yemen Safe Motherhood Alliance for the support and usage of DHS row data. The authors also would like to thank Dr. Nagiba Al-Shawafi for support and information related to Yemen.

Author Contributions

Conceived and designed the experiments: GAA KN. Analyzed the data: GAA KN KS MK. Wrote the manuscript: GAA KN KS MK.

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