

# Knowledge Translation in Africa for 21<sup>st</sup> Century Integrative Biology: The “Know-Do Gap” in Family Planning with Contraceptive Use among Somali Women

Ahmed A. Ahmed,<sup>1</sup> Abdullahi A. Mohamed,<sup>1</sup> Ibrahim A. Guled,<sup>2</sup>  
Hayfa M. Elamin,<sup>3</sup> and Alaa H. Abou-Zeid<sup>4</sup>

## Abstract

An emerging dimension of 21<sup>st</sup> century integrative biology is knowledge translation in global health. The maternal mortality rate in Somalia is amongst the highest in the world. We set out to study the “know-do” gap in family planning measures in Somalia, with a view to inform future interventions for knowledge integration between theory and practice. We interviewed 360 Somali females of reproductive age and compared university-educated females to women with less or no education, using structured interviews, with a validated questionnaire. The mean age of marriage was 18 years, with 4.5 pregnancies per marriage. The mean for the desired family size was 9.3 and 10.5 children for the university-educated group and the less-educated group, respectively. Importantly, nearly 90% of the university-educated group knew about family planning, compared to 45.6% of the less-educated group. All of the less-educated group indicated that they would *never* use contraceptives, as compared to 43.5% of the university-educated group. Prevalence of contraceptive use among ever-married women was 4.3%. In the less-educated group, 80.6% indicated that they would not recommend contraceptives to other women as compared to 66.0% of the university-educated group. There is a huge gap between knowledge and practice regarding family planning in Somalia. The attendant reasons for this gap, such as level of education, expressed personal religious beliefs and others, are examined here. For primary health care to gain traction in Africa, we need to address the existing “know-do” gaps that are endemic and adversely impacting on global health. This is the first independent research study examining the knowledge gaps for family planning in Somalia in the last 20 years, with a view to understanding knowledge integration in a global world. The results shall guide policy makers, donors, and implementers to develop a sound family planning policy and program to improve maternal and child health in 21<sup>st</sup> century primary healthcare.

## Introduction

**A**N EMERGING DIMENSION OF 21<sup>st</sup> CENTURY integrative biology is knowledge translation in global health. The “know-do” gaps are ever present in numerous fields of clinical medicine and greatly impact knowledge translation. Importantly, the “know-do” gap has been little examined in the African continent. A case in point is family planning, critical to improving maternal health and reducing maternal and child mortality. In Senegal, for example, whilst “80% of men and 70% of women had ever heard about any contra-

ceptive method, only 46% of men and 23% of women could spontaneously mention a specific contraceptive method” (Ndiaye et al., 2003). Therefore, we have set out to study the “know-do” gap in family planning measures in Somalia with a view to inform future interventions for knowledge integration between theory and practice.

Family planning (FP) is a critical element to improving maternal health, under Millennium Development Goal 5 (MDG-5) (Eltomy et al., 2013; WHO, 2011). Promotion of family planning in countries with high birth rates has the potential to reduce poverty and hunger, and avert 32% of all

<sup>1</sup>United Arab of Emirates Red Crescent, Mogadishu, Somalia.

<sup>2</sup>Médecins Sans Frontières–France, Mogadishu, Somalia.

<sup>3</sup>Sudanese Ministry of Health, Khartoum, Sudan.

<sup>4</sup>Public Health Department, Faculty of Medicine, Cairo University, Cairo, Egypt.

maternal deaths and 10%–20% of childhood deaths (Cleland et al., 2006). Following complex emergencies, relief efforts traditionally focus on acute-phase survival, including basic emergency obstetric care. However, reproductive health should be covered in both relief and development programs, because it is essential for the long-term survival of the population. This is particularly true for contraceptive services, whose functioning requires sufficient staff training, counseling skills, supplies, equipment, and client trust (Kollie et al., 1999). A World Health Organization (WHO) study estimated 25%–50% of maternal mortality among refugees was due to unsafe abortion, indicating a considerable unmet need for contraception (Cohen, 1998). Health care providers now recognize the need to provide contraceptive services. However, despite moves to improve provision, barriers to access remain a challenge (Degni et al., 2006; Whelan et al., 2007).

After more than two decades of conflict, there is still political instability in Somalia. With more than 10 million population, Somalia is administratively divided into three zones: Northwest Zone, Northeast Zone, and war-torn South Zone. Life expectancy is 50 and 51 years for males and females, respectively. The health system collapsed after the collapse of the government in 1991 and since then, many attempts were made to restore the health system with very limited success in the last 2 years (Maya et al., 2012; World Health Organization, 2012). Women and girls disproportionately suffer the effects of instability and conflict. A woman has a one in ten risk of dying during her reproductive years (McGinn et al., 2004). Due to the lack of health services, it is not surprising that the maternal mortality rate in Somalia is among the highest in the world. For every 100,000 live births, 1044 women die of pregnancy-related causes (Somaliland Ministry of Planning and National Development and UNICEF, 2013). In addition, the under-five mortality rate is 91 per 1000 live births, which is among the highest in the world (Somaliland Ministry of Planning and National Development and UNICEF, 2013). Contraceptive use in Somalia is very low, according to the minimal literature available. Unmet demand for family planning has been very high among currently married women of reproductive age in Somalia, of whom only 1.2% are using a modern method of family planning. Natural methods, especially lactation amenorrhea, are by far the most used amongst women desiring birth spacing. Determinants related to the low use of modern family planning have not been well explored in literature, but are assumed to be sociocultural and religion-based, combined with low awareness of potential benefits (Mazzilli and Davis, 2009a).

In a survey of 74 pharmacies in the northwest part of Somalia, two-thirds of pharmacy staff reported that clients ask about family planning. However, about one-third did not sell contraceptives due to low demand for the products (Mazzilli et al., 2009b). Decision-making concerning fertility control, contraception, and family planning is, for many people, a deeply personal and sensitive issue, often involving religious or philosophical convictions. A WHO expert committee defined five methods in 1975 to evaluate the success of family planning programs. One of them was the evaluation of knowledge, attitude, motivation, and behavior among people. The knowledge and attitude of people towards family planning were important determinants in the adoption of methods (WHO, 1975). Very few studies on family planning in Somalia were found in the literature. Basic information such as

Knowledge, Attitude, and Practice information regarding family planning is sorely needed to guide the evolving health system in Somalia after more than 20 years of civil war. It will also help Somalia to set a family planning program to reduce maternal and child mortality toward achieving their MDG. This study was conducted to determine the knowledge, attitude, and practice of family planning among Somali women.

## Methods

### Study design

This was a cross sectional study to assess the knowledge, attitude, and practice of Somali women regarding family planning as a measure to improve maternal and child health. The study site was Mogadishu, the capital city of Somalia. Mogadishu has ten hospitals and more than 75 primary health care facilities serving a population of about 1.5 million.

### Sampling method

The study was drawn from a population of Somali women aged from 18–45 years, recruited from four health facilities and three universities in Mogadishu. Those recruited included women attending different health facilities for reasons other than being seriously ill. Female students enrolled in three Mogadishu universities (Simad, Mogadishu, and Banadir Universities) in their last academic year were excluded from the study. The study took place in one hospital, and three health facilities, which were run by non-governmental organizations. Stratified sampling between the health facilities and the three universities ensured enough educated women, and women with a different socioeconomic status and health-seeking behaviors were included.

In each study site, each researcher was interviewing two-three women per day. Three researchers were involved in total. Researchers examined the register of the students in each university to estimate the number of female students in their last academic year in any faculty. From each university, researchers recruited 55 students using a systematic random sampling technique. A similar systematic random sampling technique was used to recruit three women from each facility, each day. Final sample size was reached with refusal of 31 women (8.6%).

### Sample size

There were very little data on the prevalence of contraceptives among Somali women. Based on data from Unicef, 2006, it was believed that the rate is very low, given their knowledge of the Somali culture and fertility pattern. We assumed the utilization rate among well-educated women as 15% and among less-educated women as 5%. We wanted to detect with 90% power the null hypothesis that the contraceptive prevalence rate among educated women was significantly higher as compared to less-educated women with a probability of 0.05. Accordingly, we calculated the sample size based on the following formula:

- Test value of difference in utilization rate = 0%
- Anticipated utilization rate among the educated and less-educated = 15% and 5%, respectively
- Level of significance = 5%
- Power of the study = 90%
- Alternative hypothesis risk difference (P1 – P2) < 0%

Given the previous assumptions, the needed sample size for each group was 153. This was increased by 10%. Accordingly, the study sample size was 170 women from Somali Universities and another 170 less-educated women recruited from health facilities. From each site, study subjects were recruited using a systematic random sampling technique. By the end of recruitment, nearly 60 women had been recruited from each university.

Data collection was done from January–May 2013 through structured face-to-face interviews using an anonymous questionnaire (KAP-SOM). The KAP-SOM questionnaire was developed in English, as all researchers were fluent in English, and it was pilot-tested in a group of 15 subjects and necessary modifications were introduced. The questionnaire was formed of four sections: sociodemographic data, knowledge, attitude, and practice of family planning. Each interview took from 40–50 minutes and was conducted by the Somali investigators.

*Ethical approval*

Ethical approval was obtained from the Banadir University Ethics Committee. All study subjects gave informed consent and were assured confidentiality and anonymity of data.

*Statistical analyses*

Data were entered into an MS Excel 2010 datasheet and verified. The Excel sheet was then exported into SPSS 16.0 for statistical analysis. A description of quantitative variables was done as a median and 25<sup>th</sup>–75<sup>th</sup> percentiles while qualitative variables were described as frequency and percentages. We compared different parameters among the two study groups. Comparing quantitative variables between the two study groups was done using the nonparametric “Mann-Whitney U test”. Comparing qualitative parameters between the two study groups was done using Chi-Square Test. *P* values were presented as significant when *p* < 0.05.

**Results**

*Demographic characteristics of the study participants*

We interviewed females in the childbearing age, who attended the four health facilities in Mogadishu for various reasons, and female students in three Somali universities. Of the 360 total females recruited for the study, 101 (28.1%)

were illiterate, 59 (16.4%) had some school education (from no education up to less than university education), while 200 (55.6%) had either some or completed university education. The mean age was 23.2 ± 3.4 for the university-educated group and 24.5 ± 5.1 for the less-educated group. The majority of the study participants were residents in Mogadishu (82.5%), while the rest were either internally displaced (8.6%) or living with a relative in Mogadishu (8.9%). The monthly income spending at home differed when comparing both groups. Only 2.5% of the less-educated group spent more than 500 USD/month as compared to 29.0% of the university-educated group, who spent more than 500 USD/month. The university-educated group were mostly singles (66.5%), whilst as many as 60.0% of the less-educated group were ever married (*p* < 0.01).

*Obstetric history of the study participants*

The study participants in the two groups showed statistically significant difference for the age when first married: the age was 21 (18.3–22) and 18 (16–20) years old for the university-educated and less for the less-educated groups, respectively (Table 1). A total of 35.8% of the married university-educated females were married before the age of 18 years, while 39.6% of the married less-educated females were married before the age of 18 years (data not shown). Among the 163 participants who were ever married, 59 (88.1%) of the university-educated group indicated that they ever got pregnant compared to 83 (86.5%) of the less-educated females (*p* = 0.8). In much the same manner, from amongst those 163 females who were ever married, 18 (18.8%) of the less-educated group were pregnant at time of interview: similarly, 20 (29.9%) of the university-educated group (*p* = 0.1) (Table 1).

Among those who were ever married, 31.0% got pregnant before the age of 18 years (data not shown). The university-educated group showed significantly lower parameters for almost all obstetric variables—except for desired child spacing—as shown in Table 1. Study groups indicated a large number of children as being satisfactory for them. The university-educated group indicated 8 (6.3–10) children, and the less-educated group indicated 10 (8–12) children as satisfactory (Table 1). Husbands are willing to have more children where almost half the study participants indicated that their husbands would agree with the number of children mentioned as satisfactory by them (48.5% and 44.4% for the university-educated and the less-educated groups,

TABLE 1. OBSTETRIC HISTORY OF EVER MARRIED STUDY PARTICIPANTS

	<i>University-educated Median (25<sup>th</sup>–75<sup>th</sup> percentile)</i>	<i>Less-educated Median (25<sup>th</sup>–75<sup>th</sup> percentile)</i>	<i>P value</i>
Age when first married	21 (18.3–22)	18 (16–20)	<0.01
Age when first got pregnant	21 (18.3–22)	18 (17–20)	0.07
Number of parities	1 (1–2)	4 (2–6)	<0.01
Number of deliveries	1 (0–1)	4 (2–6)	<0.01
Number of delivered live children	1 (0–2)	4 (2–6)	<0.01
Number of current children	1 (0–2)	3 (2–5)	<0.01
Number of boys	0 (0–1)	1 (1–3)	<0.01
Desired child spacing period (years)	2 (1.5–2)	1 (1–2)	0.11
Desired family size (children)	8 (6.3–10)	10 (8–12)	<0.01

respectively). However, 43.5% and 48.8% of the university-educated and the less-educated groups, respectively, indicated that they were not sure about their husband's preference (data not shown).

#### Knowledge about the concept of family planning

Study participants were asked if they knew any method that enabled avoiding pregnancy. The university-educated group (89.5%) knew more about family planning/birth control methods as compared to the less-educated group (54.4%), which is a statistically significant difference ( $p < 0.001$ ).

Regarding the methods of family planning, participants mentioned oral contraceptive pills as the commonly used method of birth control by both university-educated and the less-educated group. While 100% of the less-educated group knew about contraceptive pills, only two-thirds of the university-educated group knew about contraceptive pills, which is a statistically significant difference ( $p < 0.001$ ). Injectable hormones came second with almost similar proportions (58.1% and 58.6%) in both groups indicating their knowledge.

From among the natural contraceptive methods, breastfeeding was the most commonly known method with 66 (36.9%) and 8 (9.2%) of the university-educated and the less-educated group stating respectively that they knew it as a contraceptive method (Table 2).

Regarding the sources of information from where study participants got their knowledge about family planning methods, 121 (67.6%) of the university-educated group and 55 (63.2%) of the less-educated group indicated they got the information in educational institutions and through an educational syllabus. The second most important source of information was verbal communication with friends and relatives in both the university-educated group (31.3%) and the less-educated group (40.2%). Television as a source of information about family planning was considered to be relatively better value for the university-educated group

(15.6%) as compared to the less-educated group (3.4%) ( $p = 0.004$ ). Health care providers were not indicated to be a source of information about family planning in both groups (0.0%) (Table 2).

#### Attitudes towards family planning

Study participants were asked if they thought that postponing pregnancy for a while could be a good thing to do. The university-educated group thought more positively about family planning; however, almost one-third (27.4%) of the university-educated and more than half (57.5%) of the less-educated indicated that family planning was a bad thing ( $p < 0.001$ ). To confirm the previous findings, higher proportions of both groups indicated that they would not use family planning in the future. However, rejecting the future use of family planning among the university-educated group (43.5%) was much lower than the less-educated group (100.0%) ( $p < 0.01$ ). Among those in the university-educated group who indicated possible use of family planning, breastfeeding (55.8%), oral contraceptive pills (26.5%), followed by injectable hormones (13.3%) were the preferred contraceptive methods for future use. The university-educated group indicated that some women might use contraceptives mostly for child spacing purposes (61.0%), or for health-related reasons (55.5%). Similarly, the less-educated group indicated health-related reasons (47.5%) and child spacing (23.0%) as the most important reasons for possible use of contraceptives among some women. Reasons for not using family planning were mainly ignorance about contraceptives (69.0% and 70.6%), and religious beliefs (40.5% and 41.3%), showing no statistically significant difference among the educated group and the less-educated group. However, a higher proportion (25.0%) of the educated group indicated that women might not use contraceptives as they do not want to limit the number of children, as compared to only 11.9% of the less-educated group ( $p = 0.002$ ). None of the participant refrained use of contraceptives because of their ineffectiveness (0.0%) (Table 3).

TABLE 2. KNOWLEDGE ABOUT FAMILY PLANNING, DIFFERENT METHODS OF CONTRACEPTION AND SOURCES OF INFORMATION ABOUT FAMILY PLANNING AMONG STUDY GROUPS

	University-educated	Less-educated	P value
Heard of methods to prevent pregnancy (family planning)	N=200	N=180	
Yes	179 (89.5%)	87 (54.4%)	<0.001
No	21 (10.5%)	73 (45.6%)	
Methods that you know	N=179	N=87	
Contraceptive pills	112 (62.6%)	87 (100.0%)	<0.001
Injectable hormones	104 (58.1%)	51 (58.6%)	0.93
Condoms	66 (36.9%)	22 (25.3%)	0.06
Intrauterine devices (IUD)	20 (11.2%)	7 (8.0%)	0.42
Female sterilization	10 (10.1%)	4 (4.6%)	0.13
Breastfeeding	66 (36.9%)	8 (9.2%)	<0.001
Withdrawal	20 (11.2%)	2 (2.3%)	0.014
Abstinence (safe period)	29 (16.2%)	2 (2.3%)	0.001
Source of information about family planning	N=179	N=87	
School syllabus	121 (67.6%)	55 (63.2%)	0.48
Self reading	19 (10.6%)	4 (4.6%)	0.1
TV	28 (15.6%)	3 (3.4%)	0.004
Radio	11 (6.1%)	2 (2.3%)	0.17
Friend or relative (verbal)...	56 (31.3%)	35 (40.2%)	0.15
Health care worker/others	0 (0.0%)	0 (0.0%)	–

TABLE 3. ATTITUDE TOWARD FAMILY PLANNING, METHODS OF CONTRACEPTION, AND REASONS FOR USE AND NON-USE OF CONTRACEPTIVES

	<i>University-educated</i>	<i>Less-educated</i>	<i>P value</i>
Is family planning is a good for you (among those who knew family planning)	<i>N</i> = 179	<i>N</i> = 87	
Yes	130 (72.6%)	37 (42.5%)	< 0.001
No	49 (27.4%)	50 (57.5%)	
Possibility of future use of family planning (among those who knew family planning)	<i>N</i> = 179	<i>N</i> = 87	
Yes	113 (56.5%)	0 (0.0%)	< 0.001
No	87 (43.5%)	160 (100.0%)	
Preferred contraceptive method (among those who indicated possible future use)	<i>N</i> = 113	<i>N</i> = 0	
Contraceptive pills	30 (26.5%)	0 (0.0%)	–
Injectable hormones	15 (13.3%)	0 (0.0%)	–
Condoms	1 (0.9%)	0 (0.0%)	–
Intrauterine device (IUD)	0 (0.0%)	0 (0.0%)	–
Female sterilization	1 (0.9%)	0 (0.0%)	–
Breastfeeding	63 (55.8%)	0 (0.0%)	–
Withdrawal	4 (3.5%)	0 (0.0%)	–
Abstinence (safe period)	5 (4.4%)	0 (0.0%)	–
Reasons for using contraceptives	<i>N</i> = 200	<i>N</i> = 180	
Have enough children	27 (13.5%)	16 (10.0%)	0.31
Child spacing	122 (61.0%)	38 (23.0%)	< 0.001
Economic reason	20 (10.0%)	9 (5.6%)	0.13
Health reason	111 (55.5%)	76 (47.5%)	0.13
Do not know	23 (11.5%)	59 (36.9%)	< 0.001
Reasons for not using contraceptives	<i>N</i> = 200	<i>N</i> = 180	
Lack of knowledge	138 (69.0%)	113 (70.6%)	0.74
Pregnancy	33 (16.5%)	7 (4.4%)	< 0.001
Incomplete family (children)	29 (14.5%)	6 (3.8%)	0.001
No reason to limit the number of children	50 (25.0%)	19 (11.9%)	0.002
Religious beliefs	81 (40.5%)	66 (41.3%)	0.89
Geographic inaccessibility	1 (0.5%)	0 (0.0%)	0.37
Financial inaccessibility	5 (2.5%)	1 (0.6%)	0.17
Husband or family rejection	11 (5.5%)	1 (0.6%)	0.02
A woman should have as many children as possible	5 (2.5%)	4 (2.5%)	1
Adversely affects breastfeeding	4 (2.0%)	1 (0.6%)	0.39
Contraceptives have side effects	3 (1.5%)	2 (1.3%)	1
Contraceptives are not effective	0 (0.0%)	0 (0.0%)	–

*Prevalence of contraceptive use*

Very few among those who were ever married used family planning methods. Only 7 (4.3%) women among 163 ever married indicated that they had ever used family planning, of which four were current users from the university-educated group and three were previous users of family planning in both groups (Table 4). Among the seven ‘ever users’ of family planning, four indicated that they used breastfeeding, whilst three indicated use of modern contraceptive methods. Two women used injectable hormones and only one woman used oral contraceptive pills. Of the three ‘ever users’ of modern contraceptives, two women indicated that they obtained the method from a hospital, and one indicated that she obtained the method from the pharmacy. The majority (80.6%) of the less-educated group indicated that they will not recommend family planning/contraceptives for other women, compared to only 34.0% of the university-educated group who rejected the idea of recommending family planning/contraceptives to other women ( $p < 0.001$ ) (Table 4).

We examined the association between certain predictive factors for knowledge translation and use of contraceptives. Previous knowledge of contraceptives and positive attitude towards contraceptives were the main predictive factors for use of contraceptives ( $p = 0.017$  and  $0.01$ , respectively). Level of education and income did not prove to be predictors for use of contraceptives (Table 5).

**Discussion**

This is the first independent research study examining the effect of education on the KAP for family planning in Somalia in the last 20 years. The results shall guide policy makers, donors, and implementers to develop a family planning policy and program to improve maternal and child health.

We interviewed 360 females in the reproductive age to inquire about their knowledge, attitude, and practice of family planning. Study participants were willing to have as many as 8 and 10 children for the university-educated group and the less-educated group, respectively. Education has an

TABLE 4. PREVALENCE OF CONTRACEPTIVE USE AMONG STUDY PARTICIPANTS

	<i>University-educated</i>	<i>Less-educated</i>	<i>P value</i>	
Use of contraceptive methods among ever-married participants	<i>N</i> =67	<i>N</i> =96		
Yes: currently	4 (6.0%)	0 (0.0%)	0.03	
Yes: in the past	2 (3.0%)	1 (1.0%)		
No: never	61 (91.0%)	95 (99.0%)		
Contraceptive method used among those who ever used family planning	<i>N</i> =6	<i>N</i> =1		
Contraceptive pills	1 (16.7%)	0 (0.0%)	0.65	
Injectable hormones	2 (33.3%)	0 (0.0%)		
Condoms	0 (0.0%)	0 (0.0%)		
Intrauterine device (IUD)	0 (0.0%)	0 (0.0%)		
Female sterilization	0 (0.0%)	0 (0.0%)		
Breastfeeding	3 (50.0%)	1 (100.0%)		
Withdrawal	0 (0.0%)	0 (0.0%)		
Abstinence (safe period)	0 (0.0%)	0 (0.0%)		
Source of modern contraceptive method	<i>N</i> =3	<i>N</i> =0		
Public hospital	1 (33.3%)	0 (0.0%)		0.26
Private hospital	1 (33.3%)	0 (0.0%)		
Public/NGO clinic	0 (0.0%)	0 (0.0%)		
Private clinic	0 (0.0%)	0 (0.0%)		
Pharmacy	1 (33.3%)	0 (0.0%)		
Other	0 (0.0%)	0 (0.0%)		
Consulted with husband about using contraceptives	<i>N</i> =6	<i>N</i> =1		
Yes	5 (83.3%)	1 (100.0%)	1.0	
No	1 (16.7%)	0 (0.0%)		
Will you recommend family planning to other women	<i>N</i> =200	<i>N</i> =180		
Yes	132 (66.0%)	31 (19.4%)	<0.001	
No	68 (34.0%)	129 (80.6%)		

impact with lower obstetric parameters among the better-educated women. Most of the participants knew about the concept of family planning, with better knowledge among the university-educated group. Attitude was worse than knowledge. Ignorance of contraceptives and religious be-

liefs were the main factors behind non-use of contraceptives in both groups. The prevalence of contraceptives among ever-married women was as low as 4.3%.

We stratified our sample based on university education, which we used a proxy for the socioeconomic status of women. Such stratification showed significant differences between the two groups.

The mean age of marriage was around 18 years. More than one-third of the study participants got married below the age of 18 years. Similar behavior was mentioned by Omar et al. (1994) when he mentioned teenage marriage as normal behavior in Somalia. Parity was around 4.5 in both groups, given the fact that the mean age of the study participants was 23.2 and 24.5 years in the study groups (Omar et al., 1994). Around one-third (31.0%) of the study participants got pregnant before the age of 18 years.

Many of the participants knew about family planning: 89.5% of the university-educated and 45.6% of the less-educated group knew the concept. Afghanistan is similar to Somalia: aspects include a long-lasting war within the country, higher rule of extreme Islamists, and very poor socioeconomic and health indicators. In Kabul, Afghanistan, knowledge about family planning was 59.2% (van Egmond et al. 2004). In the Democratic Republic of Congo, knowledge about family planning was 76%, and in Nigeria it was better at 94.3% (Mathe et al. 2011; Obisesan et al. 1998).

For knowledge on the type of modern methods, we found that oral contraceptive pills were the better known in both study groups. This finding is similar to the finding by among female Somali refugees in Djibouti in UNHCR, 2011, where the contraceptive pill was the most known modern method.

TABLE 5. PREDICTIVE FACTORS FOR KNOWLEDGE TRANSLATION OF CONTRACEPTIVE USE AMONG STUDY POPULATION

	<i>Contraceptive use</i>		<i>P Value</i>
	<i>Ever users</i> ( <i>N</i> =7)	<i>Non-users</i> ( <i>N</i> =156)	
Education			
Illiterate	0 (0.0%)	44 (28.2%)	0.198
Read and write	2 (28.6%)	45 (28.2%)	
Some school	2 (28.6%)	47 (30.1%)	
University	3 (42.9%)	21 (13.5%)	
Monthly income			
< 300 \$	2 (28.6%)	88 (56.4%)	0.25
300–500 \$	4 (57.1%)	45 (28.8%)	
> 500 \$	1 (14.3%)	23 (14.7%)	
Heard of contraceptives			
Yes	7 (100.0%)	83 (53.2%)	0.017
No	0 (0.0%)	73 (46.8%)	
Family planning is good			
Yes	6 (85.7%)	54 (34.6%)	0.01
No	1 (14.3%)	102 (65.4%)	

Some

However, the same study found that condoms, injectable hormones, followed by contraceptive pills, were the most known family planning method among Somali refugee women in Kenya (The United Nation Refugee Agency‘ UNHCR and Women Refugee Committee, 2011). In Nigeria, Obisesan et al. (1998) found that oral contraceptive pills came second to condoms. However, among the natural contraception methods, breast-feeding was the most commonly known method in the study groups. UNHCR (2011) also found that many Somali refugee women in Djibouti not using family planning because they were breastfeeding (The United Nation Refugee Agency UNHCR and Women Refugee Committee, 2011). In addition, Mazzili and Davis (2009a) confirmed this finding when they found that lactational amenorrhea was by far the most used method amongst women desiring birth spacing in Somalia (Mazzili et al., 2009b).

Regarding the sources of information on knowledge of family planning methods, both study groups cited the school syllabus and verbal communication with friends and relatives to be the main sources of information. This is similar to the findings of a study conducted amongst high school students in neighboring Ethiopia in 1993 when the students cited schools as the source of information on contraceptive (Fantahum et al., 1995). However, both groups in our study did not cite health care providers as a source of information about family planning. Similarly, mass communication such as TV and radio had a limited role in spreading information. Two decades of complexity and rampant violence involving Islamic extremists have probably made it difficult to use mass communication to promote family planning.

Preference of contraceptive use was very brutal and worse as compared to the knowledge. One hundred percent of the less-educated group indicated that they will not use contraceptives in the future, whilst around half (56.5%) of the university-educated group indicated possible use in the future. In Gaza, which is known for high reproductive indices, 98% of women favored family planning and 88% planned to use a contraceptive in the future (Donati et al., 2000).

Ignorance of contraception and religious beliefs were the main factors behind refusal of contraception in our study. This is similar to what Khan et al. (2012) found when they reported that religious beliefs accounted for 69% of the barriers to contraceptive use in Pakistan. However, this was opposite to the findings among Jordanian women, of whom 43.8% refused. In addition, opposition among Jordanian women to use contraception was mainly due to fertility reasons, such as being pregnant at the time of interview. The different levels of education and culture between Somali and Jordanian women may explain the difference in attitude towards family planning (Mahadeen et al., 2012). On another note, the difference in attitude between the university-educated and less-educated women indicates the need to focus more on education to improve attitudes towards family planning and birth spacing for the better health of the mother and her newborn (Cleland et al., 2006).

Participants indicated that they are willing to have as many as 9.3 and 10.5 children for the university-educated group and the less-educated group, respectively. This finding coincides with the high fertility rates in Somalia. In Tanzania, a study in 2013 found out that the desired family size is as small as 4 (Mosha et al. 2013). In a limited reproductive health

survey conducted in Somalia in 2002, the average family size was mentioned as 5.2 children, which puts Somalia ahead of any other countries regarding the desired family size (van Egmond et al., 2004).

Although both study groups indicated that they wanted to have spacing between pregnancies, the university group indicated 1.6±0.6 years and the less-educated group indicated 1.5±0.7 years, yet both study groups did not meet WHO’s Healthy Timing and Spacing of Pregnancy recommendations. In the Democratic Republic of Congo, the Health Timing and Spacing of Pregnancy Recommendations were met (Mathe et al., 2011).

Prevalence of contraceptives among ever-married women were as low as 4.3%. The majority (80.6%) of the less-educated group indicated that they wouldn’t recommend contraceptives to other women. The prevalence of contraceptives among Kenyan women was as low as 7% in 1979, increasing to 27% in 2003 owing to massive information campaigns and improved access to contraceptives through government health centers (Cleland et al., 2006). Similarly, the prevalence of contraceptive use was 26.8% in Tanzania but as low as 10% among Nigerian women (Mosha et al., 2013; Obisesan et al., 1998). In other Muslim countries, the prevalence of contraceptive use is different but improved over time. In 1990, only 12% of Pakistani women and 30% of women in Bangladesh used contraception (Sultan et al., 2002). However in Jordan, the prevalence of contraceptive use was 37% as estimated in 2012 (Mahadeen et al., 2012). In Afghanistan, the prevalence of contraceptive use amongst married women was 22.9% (van Egmond et al., 2004).

In our study, the reasons for not using contraceptives were mainly ignorance about contraceptives and expressed personal religious beliefs. This is comparable to a study reported from Nigeria and Tanzania where religious beliefs were one of the causes of non-use of contraceptives in both Islamic and Christian groups (Emmanuel et al., 2010; Mosha et al., 2013). On the contrary, in other more liberal Islamic countries like Jordan, the expressed religious beliefs of the respondents as a predictive factor for non-use of contraceptives was mentioned by only 0.1% of the study sample (Mahadeen et al., 2012).

Lack of literature on family planning in Somalia has affected our ability to compare our results about the effect of education on KAP with similar results from Somalia. In addition, the sample size used was small and our study participants did not include enough women above the age of 30 years. The quantitative design with its limitation did not allow deep examination of the reasons behind different responses. So, there is a need to have more studies with a bigger number of participants, using both quantitative and qualitative methods to cover the three zones of Somalia to get better information. Our findings, although emerging from Mogadishu, included refugees and the urban poor, which make our findings applicable to rural Somalia. We also recommend including male participants in future studies as important contributors into family planning.

## Conclusion and Recommendations

Somalia does not meet WHO’s Healthy Timing and Spacing of Pregnancy recommendations. The extremely low prevalence of contraceptives is a challenge to attain any

reduction in maternal and child mortality and the Millennium Development Goals in this region of the world. There is a huge gap between knowledge, attitude, and practice regarding family planning in Somalia. Somalia has to do better to improve and bridge the gap between knowledge from one side and attitude and practice on the other side towards family planning to attain a reduction in maternal and child mortalities. Advocacy through modest public leaders, training of health workers, advocacy for modern contraception, establishing family planning services in all public health facilities, and promoting family planning during contact with women are highly recommended. A clear policy that results in a national family planning program with sufficient resources should be in place on urgent basis. It should be part of the national health plans under the maternal and child health area.

For primary health care to gain traction in Africa, we need not only invest in new research but also to address the existing “know do” gaps that are endemic and adversely impacting on global health. Moreover, we wish to emphasize that the Technology Assessment in Africa (TAF) for new OMICS technologies needs to be conceptually framed through the lens of integrative biology and “know do” gaps as well.

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Address correspondence to:

*Alaa H. Abou-Zeid, MBCh, MPH MSc, PhD  
Public Health Department  
Faculty of Medicine  
Cairo University  
1 Lebanon Square  
Agouza, Mohandesin  
12411, Cairo  
Egypt*

*E-mail: alaabouzeid@kasralainy.edu.eg*