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ORIGINAL ARTICLE

Female genital mutilation and contraceptive use: findings from the 2014 Egypt demographic health survey

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Abstract

Objectives Female genital mutilation (FGM) includes procedures that remove partial or total external female genitalia, or causes other injury to female genital organs with no medical reason. Physical and psychological trauma associated with FGM may interfere with a woman's ability and intent to utilize contraception. Our study examines the association between FGM and utilization of contraception methods among sexually active reproductive-aged women in Egypt.

Methods Data from the 2014 Egypt Demographic and Health Survey were analyzed (n = 20,055). Multinomial logistic regression was used to obtain odds ratios (OR) and 95% confidence intervals.

Results Our study found that FGM was performed on over 90% of Egyptian women and almost half (45%) of women did not use contraception. Women with FGM had significantly lower odds (OR = 0.6) of using barrier/natural contraceptive methods (e.g., condoms) than intrauterine devices (IUDs). However, women with FGM were more likely to use hormonal methods (OR = 1.2) than IUDs compared to those who had not experienced FGM.

Conclusions In order to promote women's health and support use of effective contraception methods, a large reduction in FGM practice is essential.

Keywords Female genital mutilation · Contraception methods · Birth control · Womens health

Introduction

In many parts of the world, females experience partial or total removal of external genitalia, or have serious injury to sexual organs with no medical reason (Peltzer and Pengpid 2014; World Health Organization 1997). Termed female genital mutilation (FGM), the removal of female external genitalia is practiced in many countries, but is predominately found in Africa (Banks et al. 2006). Over half of all women and girls who experience FGM live in Egypt, Ethiopia, and Indonesia (United Nations International Children's Fund 2016). In fact, approximately 9 in 10 Egyptian women (89%) experience FGM (Ministry of Health and Population of Egypt 2015).

FGM has no known evidence-based health benefits; rather, it has many short- and long-term complications including excruciating pain, hemorrhage, injury to adjacent structures, acute urinary retention, dyspareunia, urinary tract infections, pelvic inflammatory disease, infertility, poor obstetric outcomes, and psychological and emotional problems (Banks et al. 2006; Berg and Underland 2013; Utz-Billing and Kentenich 2008). These short- and long-term complications of FGM may interfere with a woman's ability to participate in health behaviors that promote and maintain a healthy lifestyle, such as effective use of contraception. Anatomical or structural damage and the high risk of reproductive tract infection among women with FGM may make insertion of an intrauterine device (IUD) difficult (Azadeh and Touré 1994; World Health

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Organization 2018a). A curricula for nurses and midwives from the World Health Organization (WHO) report that IUD insertion is difficult due to infections (Type 1 FGM), scaring of the introitus (Type 2 FGM), and narrowing of the vagina (Type 3 FGM) (World Health Organization 2001).

Psychological effects associated with FGM, such as depression, chronic anxiety, and mood disorders (Azadeh and Touré 1994), may also impact adaptive functioning, which can affect a woman's ability to choose effective contraception (Brindis et al. 2005). In fact, depression, depressive symptoms, and anxiety have been associated with use of less effective contraception methods (Hall et al. 2015). An inability to choose and use effective contraceptive methods may result in a number of negative health effects (Cleland et al. 2012) including short interpregnancy interval (de Bocanegra et al. 2014) and unintended pregnancy (Trussell and Guthrie 2007).

Family planning and reproductive programs are integral for preventing poor maternal and child health outcomes (Banks et al. 2006). A key component of these services is the promotion of effective contraception. In 2005, it was reported that the most commonly used contraceptives in Egypt were IUD, pills, and injections (Banks et al. 2006). However, 1 in 6 women did not use contraception. Further, 33% of women not using contraception never intended to do so (Banks et al. 2006). In the last few decades, IUD has surfaced as one of the most effective long-acting contraceptive methods and is completely reversible when a woman desires to have more children (Hubacher and Grimes 2002). Moderately effective methods, including injectables and birth control pills, are the second most used contraceptive methods and confer a wide range of health benefits outside pregnancy prevention (Dragoman 2014).

Despite the lack of evidence-based health benefits of FGM, this practice has continued due to strong cultural, traditional, and religious beliefs. Establishing an association between FGM and contraceptive use may help public health practitioners provide targeted health education, which could subsequently improve women's health and pregnancy outcomes. To the authors' knowledge, no study has assessed the independent association between FGM and the use of different forms of contraceptive methods in Egypt. Therefore, the objective of the current study is to examine the association between FGM and the use of different types of contraception methods among currently married/in union reproductive-aged women in Egypt.

Methods

The current study analyzed data from the 2014 Egypt Demographic and Health Survey Program (EDHS). The EDHS is part of an international project that collects and disseminates nationally representative data on health, population, and nutrition in over 90 countries. The project is funded by the United States Agency for International Development (USAID), with additional funds from other donors and participating countries. A systematic random sample of 29,471 households was chosen for the survey, using the household listing obtained from the selected areas. Ever-married women between the ages of 15 and 49 years in the household were eligible (n = 21,903). Of the eligible women, a total of 21,762 women were successfully interviewed, resulting in a response rate of 99.4%. Data collection took place from March through June 2014. The implementation of the EDHS was approved and supported by the Egyptian Ministry of Health and Population (MOHP) (Ministry of Health and Population of Egypt 2015). The current study included non-menopausal women who were currently in union/living with a man, had not reached menopause or had a hysterectomy, were not practicing abstinence, and did not have missing information on FGM and contraceptive use, resulting in a total sample size of 21,386 (weighted frequency: 21,374). DHS defines menopausal if they are not currently using a contraception method, have not had a period in the last 6 months, are not pregnant and does not postpartum amenorrhea, or they report being in menopause (Demographic and Health Surveys 2013).

The 2014 EDHS was comprised of the: (1) household and (2) individual questionnaires. Only the individual questionnaire was used for this study and included information about respondent's background, reproduction, contraceptive knowledge and use, female circumcision, pregnancy and breastfeeding, child immunization and health, child nutrition, etc., and was administered to eligible women in each household (Ministry of Health and Population of Egypt 2015). Additional details on the sample design are provided elsewhere (Ministry of Health and Population of Egypt 2015).

Study variables

The exposure of interest, FGM, was dichotomized (yes; no) using the following question: "Have you yourself been circumcised." The main outcome of interest was contraceptive method used by the respondent. Participants were asked if they were using any methods to avoid getting pregnant. If they answered yes, they were asked the following question: "Which method are you using?" Contraceptive methods were categorized into five categories: (1) nonuse, (2) hormonal-based methods (pills, implants/Norplant, or injectable), (3) permanent methods (vasectomy or tubal ligation), (4) IUD, and (5) barrier/natural methods (condom, diaphragm/foam/jelly, withdrawal, periodic abstinence, prolonged breastfeeding, or other).

Contraceptive methods were grouped based on effectiveness against unintended pregnancy with typical use, with the exception of implants/Norplant (World Health Organization 2016). We included implants/Norplant with hormonal-based method because its use would not be inhibited based on anatomical or physical changes of the vagina from FGM.

Based on the literature, additional variables were considered as potential confounders (Adanu et al. 2009; Cohen 2000; Daniels et al. 2015; El-Zeini 2008; Eltomy et al. 2013; Kavanaugh et al. 2011; Nelson et al. 2017; Sultan et al. 2010). The following variables were obtained from the individual questionnaire: age (15–19; 20–29; 30–39; 40–49); years of education completed (none; primary; secondary; more than secondary; unknown), husband/partner's age ($\leq$ 24; 25–44; $\geq$ 45), husband/partner's educational status (none; primary; secondary; more than secondary; unknown), religion (Muslim; other), currently working (yes; no), place of residence (urban; rural), marriage type (monogamous; polygamous), health care decision maker (self; joint; husband/partner; other); wealth index (poorest; poor; middle; richer), parity (nulliparous; 1–4 children born; 5 or more children born), and media exposure (yes; no). In addition, a composite variable for a flag of IPV indicators was created from several questions regarding whether a beating was justified given certain hypothetical scenarios. This flag was "yes" if the respondent answered that the beating was justified for one or more scenarios. Effect modification was tested for IPV, education, religion, and age.

Statistical analysis

Weighted percentages are reported to assess baseline sample characteristics by contraceptive methods using Wald χ^2 tests for categorical variables and ANOVA test for continuous variables. Multinomial logistic regression models were used to examine the association between FGM and contraceptive use while adjusting for confounders. Variables identified from the literature as potential confounders were included in the final model if each variable changed the unadjusted estimate between FGM and contraceptive method by greater than 10% (Rothman et al. 2008). In other words, if the addition of a potential confounder variable changed the estimate in either a positive or negative direction by at least 10% they were included in the final model. Effect modification (i.e., interaction) was tested using interaction terms. Odds ratios and 95% confidence interval (CI) are reported. All analyses accounted for the complex sampling design computed by DHS which allows estimates to be generalized to Egypt. Analyses were conducted using SAS statistical software (version 9.4, SAS Institute, Cary, NC).

Results

In this study population, the weighted prevalence of FGM was 92.3%. Approximately 43% of women were not using contraceptives, while over a quarter (28%) were using IUDs. The majority of the sample population were between the ages of 20–39 years, had a secondary school education, were not currently working, lived in the rural region, and were in a monogamous marriage. Husband/partner age, maternal education, age, husband/partner's education, current working status, place of residence, wealth index, type of marriage, media exposure, parity, health care decision maker, IPV indicator, and FGM were significantly associated with contraception use ($p < 0.05$) (Table 1). Table 2 shows sample characteristics according to FGM status. Overall, women with FGM were more likely to have a secondary education, not work, live in a rural setting, have a husband or partner who was 25–44 years old, and report that health care choices were a joint decision.

Table 3 displays findings from the unadjusted and adjusted multinomial logistic regression models. In the unadjusted analysis, the odds of using hormonal contraception methods were 1.4 times higher among women who had FGM compared to women who did not undergo FGM. Conversely, women who experienced FGM had lower odds of choosing barrier/natural methods compared to women who did not undergo FGM. After adjusting for husband/partner age, partner's education, place of residence, wealth index, health care decision maker, IPV indicator, and parity, the odds of using barrier/natural contraception methods were 0.61 times (adjusted odds ratio (AOR) = 0.61; 95% CI 0.43–0.85) lower among women who had experienced FGM compared to those who had not experienced FGM. No statistically significant association was found between FGM and contraception nonuse, hormonal methods, or permanent methods.

Discussion

Our study found that a woman's FGM status was associated with type of contraception method utilized. Women with FGM were more likely to use hormonal contraception methods (pills, implants/Norplant, and injectable) over IUDs compared to women who did not undergo FGM. However, women with FGM had lower odds of less effective contraceptive methods (i.e., barrier/natural methods), such as a condoms, diaphragm or withdrawal, than IUDs.

The increased likelihood of utilizing hormonal birth control methods over IUDs among women who had undergone FGM could be explained through physical

Table 1 Sample characteristics by contraceptive methods used (Egypt 2014)

Variables	Total *n* (%)	Contraceptive use *n* (column %)					*p* value[a] (χ^2)
		Nonusers	Barrier/natural methods	Hormonal-based methods	Permanent methods	IUD	
	n = 21,386	*n* = 9717	*n* = 483	*n* = 5190	*n* = 217	*n* = 5779	
Age							N/A
15–19 years	736 (3.6)	590 (6.5)	10 (6.5)	72 (67.6)	0 (0.0)	64 (1.2)	
20–29 years	7738 (36.3)	4038 (42.2)	168 (35.1)	1859 (36.1)	4 (2.0)	1669 (29.1)	
30–39 years	7553 (35.4)	2745 (27.7)	186 (39.2)	2172 (41.4)	80 (41.6)	2370 (41.5)	
40–49 years	5359 (24.7)	2344 (23.6)	119 (23.0)	1087 (21.1)	133 (56.4)	1676 (28.2)	
Husband's/partner's age							< 0.0001
≤ 24 years	739 (3.6)	538 (5.8)	12 (2.5)	102 (2.0)	1 (0.1)	86 (1.6)	
25–44 years	13,865 (65.4)	6302 (65.6)	312 (63.6)	3594 (69.8)	64 (33.7)	3593 (62.8)	
≥ 45 years	6782 (31.1)	2877 (28.6)	159 (32.9)	1494 (28.2)	152 (66.2	2100 (35.6)	
Education							< 0.0001
No education	4709 (23.7)	2237 (23.9)	75 (18.0)	1277 (27.0)	74 (35.1)	1046 (20.8)	
Primary education	2135 (10.3)	1014 (10.6)	28 (6.0)	524 (10.0)	38 (16.9)	531 (10.0)	
Secondary education	11,387 (52.1)	5096 (51.7)	251 (47.5)	2793 (52.4)	86 (40.0)	3161 (53.1)	
> Secondary education	3155 (14.0)	1370 (13.8)	129 (28.5)	596 (10.6)	19 (8.0)	1041 (16.1)	
Partner's education							< 0.0001
No education	3434 (16.9)	1681 (17.6)	53 (12.2)	894 (18.5)	38 (19.1)	750 (14.5)	
Primary education	2931 (14.3)	1257 (13.3)	46 (9.7)	794 (15.7)	38 (19.1)	796 (14.8)	
Secondary education	11,442 (52.6)	5224 (53.2)	244 (48.3)	2806 (52.9)	91 (42.4)	3077 (52.0)	
> Secondary education	3575 (16.2)	1554 (15.9)	140 (29.8)	695 (12.9)	32 (14.4)	1154 (18.7)	
Current working status							< 0.0001
Not working	18,007 (84.5)	8347 (86.2)	374 (74.9)	4409 (85.3)	179 (83.7)	4698 (82.1)	
Working	3352 (15.5)	1360 (13.8)	109 (25.1)	772 (14.7)	38 (16.3)	1073 (17.9)	
Religion							0.1270
Muslim	20,524 (96.1)	9349 (96.2)	454 (94.1)	4980 (96.2)	200 (91.9)	5541 (96.4)	
Other	856 (3.9)	366 (3.8)	29 (5.9)	210 (3.8)	17 (8.1)	234 (3.6)	
Place of residence							< 0.0001
Urban	9453 (34.9)	4030 (33.2)	258 (43.9)	2145 (31.6)	94 (34.5)	2926 (39.7)	
Rural	11,933 (65.1)	5687 (66.8)	225 (56.1)	3045 (68.4)	123 (65.5)	2853 (60.3)	
Wealth index							< 0.0001
Poorest	3877 (17.8)	1959 (18.9)	84 (16.6)	1040 (20.1)	52 (24.4)	742 (14.0)	
Poor	3934 (19.6)	1951 (21.0)	60 (14.4)	1040 (20.6)	43 (21.8)	840 (16.9)	
Middle	3995 (22.4)	1775 (21.8)	69 (17.9)	1020 (23.5)	31 (17.2)	1100 (22.9)	
Richer	9580 (40.3)	4032 (38.4)	270 (51.1)	2090 (35.8)	91 (36.6)	3097 (46.2)	
Type of marriage							< 0.0001
Monogamous	20,558 (96.6)	9164 (94.9)	477 (98.8)	5034 (97.6)	205 (94.1)	5678 (98.3)	
Polygamous	799 (3.4)	533 (5.1)	6 (1.2)	150 (2.4)	12 (5.9)	98 (1.7)	
Media exposure							0.0008
Yes	21,179 (98.9)	9597 (98.6)	475 (97.5)	5157 (99.3)	212 (97.5)	5738 (99.3)	
No	205 (1.1)	120 (1.4)	8 (2.5)	33 (0.7)	5 (2.5)	39 (0.7)	
Parity							N/A
No children	1990 (8.8)	1987 (20.0)	0 (0.0)	3 (0.0)	0 (0.0)	0 (0.0)	
1–4 children	16,635 (78.6)	6688 (70.0)	413 (84.2)	4308 (83.4)	119 (57.9)	5107 (88.2)	
5 + children	2761 (12.6)	1042 (10.1)	70 (15.8)	879 (16.5)	98 (42.1)	672 (11.8)	

Table 1 (continued)

Variables	Total *n* (%)	Contraceptive use *n* (column %)					*p* value[a] (χ^2)
		Nonusers	Barrier/natural methods	Hormonal-based methods	Permanent methods	IUD	
	n = 21,386	*n* = 9717	*n* = 483	*n* = 5190	*n* = 217	*n* = 5779	
Health care decision maker							< 0.0001
Self	3205 (14.5)	1418 (15.7)	62 (12.3)	852 (14.1)	29 (10.6)	844 (13.4)	
Joint decision	13,415 (68.3)	5286 (64.6)	352 (72.6)	3446 (68.5)	150 (71.1)	4181 (72.7)	
Partner	3251 (16.1)	1551 (17.9)	68 (14.8)	872 (17.0)	37 (18.0)	723 (13.1)	
Others	180 (1.1)	127 (1.8)	1 (0.3)	20 (0.3)	1 (0.4)	31 (0.7)	
IPV indicator							< 0.0001
Yes	7219 (36.0)	3588 (38.8)	129 (29.7)	1890 (38.5)	72 (34.7)	1540 (30.0)	
No	13,883 (64.0)	5992 (61.2)	349 (70.3)	3230 (61.5)	143 (65.3)	4169 (70.0)	
Female genital mutilation							< 0.0001
Yes	19,184 (92.3)	8611 (91.5)	411 (85.5)	4746 (94.3)	205 (94.0)	5211 (92.2)	
No	2202 (7.7)	1106 (8.5)	72 (14.5)	444 (5.7)	12 (6.0)	568 (7.8)	

IPV Intimate partner violence, *IUD* intrauterine device

[a]Based on χ^2 test for categorical variables

changes to the female reproductive anatomy. The majority of women with FGM experience physical consequences such as dyspareunia, penetration problems, urinary tract infections, and menstruation problems (Utz-Billing and Kentenich 2008). Therefore, insertion of IUD's may be inhibited due to the anatomical and structural damage to the vagina, including introitus scaring (Azadeh and Touré 1994; Morison et al. 2001). As a result, these women may choose less invasive contraception methods, such as hormonal birth control methods.

Psychological effects of FGM may also inhibit women to choose high efficacy contraception methods (i.e., IUDs). Women with FGM are at higher risk for post-traumatic stress disorder, anxiety, depression (World Health Organization 2018b), psychosis, neurosis, and psychosomatic disease (Utz-Billing and Kentenich 2008). This could result in difficulties negotiating contraceptive use with their partners and reduce self-esteem (Green et al. 2014). Research has shown that depression leads to less amicable conversations and results in topic avoidance as a way to withdraw from challenging situations (Knobloch et al. 2016). In addition, a longitudinal study reported that women's low self-esteem was significantly associated with ineffective use of contraception, defined as the inconsistent use of condoms, birth control pills, or the use of the withdrawal method (Nelson et al. 2017).

In Egypt, contraception utilization is impacted by a multitude of factors, including accessibility, availability, and social acceptability (Banks et al. 2006). A previous study reported that Egyptian woman's contraception use was influenced by potential side-effects of contraception and direct economic costs (El-Zeini 2008). The public often assumes that Islamic religion may negatively impact contraception use. Yet, Islamic law on contraception states that modern contraception methods are acceptable (Dardir and Ahmed 1981). However, Islamic religion is hypothesized to contribute to the high rates of FGM in Egypt (Hoffmann 2013).

To the authors' knowledge, this is the first study to yield information about contraception use among women with FGM in Egypt—a country with the third highest rate of FMG in the world (Ministry of Health and Population of Egypt 2015). This study utilized a large, nationally representative sample of women in Egypt. However, the EDHS does not distinguish severity of FGM. Further, FGM is self-reported, which could be prone to social desirability bias. However, social desirability bias may not have affected the findings due to the high prevalence of FGM in this study population. The cross-sectional nature of the study does not warrant a causal link between FGM and contraception use; nonetheless, temporal precedence is established since FGM typically occurs before contraception use. Lastly, we could not account for the impact of intimate partner violence (IPV) in the relationship between FGM and contraceptive use because of the high prevalence of missing data on IPV (> 65%).

Table 2 Sample characteristics by female genital mutilation status (Egypt 2014)

Variables	Female genital mutilation *n* (column %)		*p* value[a]
	Yes *n* = 19,184	No *n* = 2202	
Age			< 0.0001
15–19 years	616 (3.4)	120 (5.7)	
20–29 years	6599 (35.1)	1139 (51.7)	
30–39 years	6938 (36.1)	615 (27.2)	
40–49 years	5031 (25.5)	328 (15.4)	
Husband's/partner's age			< 0.0001
≤ 24 years	620 (3.4)	119 (4.8)	
25–44 years	12,219 (64.5)	1646 (76.0)	
≥ 45 years	6345 (32.0)	437 (19.2)	
Education			< 0.0001
No education	4425 (25.0)	284 (8.7)	
Primary education	1963 (10.7)	172 (4.8)	
Secondary education	10,398 (52.4)	989 (48.1)	
> Secondary education	2398 (11.9)	757 (38.3)	
Partner's education			< 0.0001
No education	3266 (17.7)	168 (6.7)	
Primary education	2705 (14.8)	226 98.2)	
Secondary education	10,377 (53.1)	1065 (46.6)	
> Secondary education	2833 (14.4)	742 (38.4)	
Current working status			0.0321
Not working	16,146 (84.7)	1861 (82.3)	
Working	3012 (15.3)	340 (17.7)	
Religion			< 0.0001
Muslim	18,522 (96.8)	2002 (88.0)	
Others	656 (3.2)	200 (12.0)	
Place of residence			< 0.0001
Urban	7912 (32.7)	1541 (61.8)	
Rural	11,272 (67.3)	661 (38.2)	
Wealth index			< 0.0001
Poorest	3630 (18.7)	247 (7.0)	
Poor	3743 (20.6)	191 (7.5)	
Middle	3695 (22.9)	300 (15.9)	
Richer	8116 (37.8)	1464 (69.6)	
Type of marriage			< 0.0001
Monogamous	18,424 (96.5)	2134 (98.2)	
Polygamous	735 (3.5)	64 (1.8)	
Media exposure			0.1334
Yes	18,994 (98.9)	2185 (99.3)	
No	188 (1.1)	17 (0.7)	
Parity			< 0.0001
No children	1658 (8.2)	332 (15.4)	
1–4 children	14,933 (78.4)	1702 (80.9)	
5 + children	2593 (13.4)	168 (3.7)	
Health care decision maker			0.0021
Self	2918 (14.5)	287 (13.6)	
Joint decision	11,948 (68.0)	1467 (72.2)	

Table 2 (continued)

Variables	Female genital mutilation *n* (column %)		*p* value[a]
	Yes *n* = 19,184	No *n* = 2202	
Partner	2940 (16.4)	311 (12.7)	
Others	161 (1.0)	19 (1.4)	
IPV indicator			< 0.0001
Yes	6819 (37.4)	400 (19.0)	
No	12,119 (62.6)	1764 (81.0)	

IPV Intimate partner violence

[a]Based on χ^2 test for categorical variables

Table 3 Association between female genital mutilation and contraceptive methods (Egypt 2014)

	Nonusers versus IUD	Barrier/natural methods versus IUD	Hormonal-based methods versus IUD	Permanent methods (i.e., sterilization) versus IUD
Crude OR (95% CI)				
FGM				
Yes	0.91 (0.79–1.05)	0.50 (0.36–0.69)**	1.40 (1.18–1.67)**	1.34 (0.68–2.64)
No	1.00	1.00	1.00	1.00
Adjusted OR (95% CI)[a]				
FGM				
Yes	0.95 (0.80–1.11)	0.61 (0.43–0.85)**	1.16 (0.97–1.39)*	0.82 (0.40–1.68)
No	1.00	1.00	1.00	1.00

IUD is used as the reference

OR Odds ratio, *CI* confidence interval, *FGM* female genital mutilation, *IUD* intrauterine device

**Statistical significance: $p < 0.05$

*Borderline significance: $p < 0.1$

[a]Adjusted for husband/partner's age, husband/partner's education, place of residence, wealth index, health decision maker, IPV indicator, and parity

Conclusions

FGM is a major public health concern that is condemned by numerous international organizations. Our study found that FGM was performed on over 90% of Egyptian women, and a woman's FGM status was associated with type of contraception method utilized. In order to ensure better health for women and their ability to use effective contraception methods, a large reduction in FGM practice is essential. Additional support is imperative for existing programs, such as the African-led initiative The Girl Generation, aimed at strengthening grassroots organizations and changing the social norms surrounding FGM (The Girl Generation 2016). Future studies should utilize mixed methods to investigate reasons for not using IUDs in women who had FGM. Additional studies are also needed to explore severity or type of FGM and contraceptive use.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval Deemed exempt by the Institutional Review Board of Virginia Commonwealth University.

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