

Assessment of Sex-Related Correlates of Condom Use Behavior among Adolescents and Young Adult Men in Ghana

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Abstract

Background: Although condom utilization may be constrained by social stigma and religious norms, adolescents and young adult (AYA) men can adopt condom behavioral changes to reduce negative reproductive health outcomes. This study examines the sex-related correlates of condom use behavior among AYA men aged 15 - 24 years in Ghana. **Methods:** This is a cross-sectional study based on the men's dataset of the 2022 Ghana Demographic and Health Survey (n = 2453). Descriptive characteristics were summarized using frequencies and proportions. Pearson's Chi-square tests of association and a binary logistic regression analysis were conducted to examine the relationship between independent variables (sexual activity, multiple sexual partnerships, history of sexually transmitted infections *STIs*, genital sores, and genital discharge), and the dependent variable (condom use behavior). **Results:** The findings from the Chi-square tests indicate that during their latest sexual encounters, condom usage rates were 19.3% among sexually active participants, 29% among those with multiple sexual partners, 21.6% among those with a history of *STIs*, and 12.5% and 21.3% among those with histories of genital sores and discharge, respectively. The logistic regression analysis results suggest that there were significantly higher odds of condom utilization among participants who engaged in multiple sexual partnerships (AOR = 29.87, 95% CI = 12.19 - 73.21, $p < 0.001$) outside their spouse than participants who had only one or no sexual partner. **Conclusion:** Condom use is sub-optimal, and engaging in multiple sexual partnerships appears to be a significant correlate of condom use behavior among sexually experienced AYA men in Ghana. Initiatives targeting the reduction of adverse sexual reproductive health outcomes should prioritize expanding safe-sex behavioral interventions and communication strategies focused on ensuring the consistent accessibility of con-

doms for young men with a history of multiple sexual encounters, thereby encouraging regular condom utilization in Ghana.

Keywords

Condom Use Behavior, Adolescents and Young Adults, Safe Sex, Men, Ghana

1. Introduction

Historically, men underutilize condoms due to reasons such as limited access, lack of pre-planning, alcohol/drug use before sex, concerns about diminished pleasure, partner discomfort, and moral objections [1]. Compared to women, men are less likely to have been tested for HIV but more likely to engage in multiple sexual partnerships that predispose them to sexually transmitted infections (STIs) [2] [3]. Therefore, with the exception of sexual abstinence and faithfulness to one uninfected sexual partner, condom use remains a crucial infection prevention measure to reduce negative reproductive health outcomes such as HIV infection, STIs, and unwanted pregnancies in Sub-Saharan Africa [4]. Moreover, achieving the global targets of HIV reduction of fewer than 370,000 new HIV infections yearly by 2025 requires a comprehensive assessment of the protective and preventive impact of condom use, coupled with the sexual correlates associated with it [5]-[7]. Whereas prior studies among Adolescents and young adults (AYAs) identified effective sexual communication with both parents as the sole predictor for increased chances of primary and secondary sexual abstinence [4], condom utilization has been restricted by cultural stigmas and religious norms, increasing the vulnerability of AYAs to STIs and unplanned pregnancies coupled with dealing with the consequences such as septic abortion [8]. Furthermore, AYAs disproportionately face vulnerable sexual experiences that make it harder to cope with the mental and emotional consequences of their actions prior to exposure with requisite HIV preventive education [5]. Therefore, it is unsurprising that AYAs account for 37% of the daily new HIV infections worldwide [5] [9].

Condom-use behaviors have been the subject of many sexuality studies in Sub-Saharan Africa, leading to recommendations to increase sexual reproductive health education addressing some gender-specific sexual behaviors [10]. Against the backdrop of experiencing the highest HIV infection burden worldwide, Sub-Saharan Africa, also accounts for sub-optimal condom utilization which has exacerbated the overall disease burden among the younger population [11] [12]. A recent study involving nine Sub-Saharan African AYA population found that only about half of the participants who were sexually active used a condom; a phenomenon attributed to early sexual debut and lack of parental support [13]. The pervasive sub-optimal uptake of condoms among mostly AYAs in Sub-Saharan Africa aligns with several recent findings specifically associating men with non-use of condoms regardless of frequency and number of sexual partners, even with the

availability of other birth control methods [14]-[16]. Likewise, studies conducted across 40 Sub-Saharan African countries involving nationally representative data indicate a pervasive under-utilization of condoms among AYAs, which also worsens with increasing age [12] [17]. This decline of condom uptake as AYAs get older underscores the need for consistent investments in effective programs aimed at reducing negative reproductive health outcomes.

In Ghana, higher odds of condom use among AYA women were identified for secondary or higher education, higher wealth status, and multiple sexual partnerships, indicating that, thus far, educational and behavioral change interventions remain imperative in the fight to end HIV and STIs among young people [18]. Among the 345,599 people living with HIV in Ghana, females aged 15 - 49 constitute 68% with an estimated HIV prevalence rate of 1.7%, aligning with trends observed across Sub-Saharan Africa [5]. The higher prevalence of females with HIV may explain the greater focus of sexuality studies on the female AYA population. However, men have been associated with a higher propensity for transmitting HIV to their sexual partners in view of structural, social, and cultural factors which pre-dispose them to multiple sexual partnerships [3]. This underscores the importance of also studying AYA men's sexuality in view of the latest demographic and health survey [19].

Specifically, sexuality knowledge gaps exist for the best available evidence regarding male condom use behaviors in Ghana, using nationally representative samples that reflect the current government investments in the health care sector. This study fills this knowledge gap and specifically examines the sex-related correlates of condom use behavior particular when AYAs have had some prior sexual experiences. Understanding condom use behavior among AYA men is essential to underpin the sexual behaviors and norms that shape adult life and influence both behavior and health [20]. It is important to explore the association and relationships that may increase the possibility of condom use for AYA men so that existing health policies can meet the current needs of this vulnerable demographic. The following research question will be considered: 1) What is the prevalence of sex-related correlates of condom use among Ghanaian AYA men aged 15 - 24 years? 2) What is the relationship between existing sexual correlates and condom use among AYA men aged 15 - 24 years in Ghana?

2. Methods

2.1. Study Design and Setting

This research is a cross-sectional secondary data study based on the 2022 Ghana Demographic and Health Survey (GDHS) conducted across Ghanaian communities, which followed a cross-sectional design [21]. The 2022 Ghana Demographic and Health Survey (GDHS) provides comprehensive national data on demographic and health indicators, ensuring consistency with past DHS surveys in Ghana and similar studies in other developing countries. This data enriches the extensive global database of population-based metrics for Ghana. The survey, con-

ducted with a sample representative of the nation, included approximately 18,540 households selected across 618 clusters covering all 16 regions. Of these households, 18,065 were found to be occupied. Among the occupied households, 17,933 were successfully interviewed, reflecting an impressive response rate of 99%. In the subset of households designated for the male survey, 7263 men aged 15 - 59 were identified for individual interviews, with 7044 of them successfully participating, resulting in a response rate of 97%.

2.2. Data Source

The 2022 Ghana Demographic and Health Survey (GDHS) was conducted from October 17, 2022, to January 14, 2023 by the Ghana Statistical Service (GSS) [21]. Therefore, *the data for this research were sourced from the male questionnaire of the GDHS*, encompassing topics such as HIV knowledge, transmission methods, information channels, STI and HIV prevention behaviors, stigma, and HIV testing background. The survey received technical support from Inner City Fund (ICF) under the Demographic and Health Survey Program (DHS), which is funded by the United States Agency for International Development (USAID) and the U.S. President's Malaria Initiative (PMI).

2.3. Inclusion and Exclusion Criteria

2.3.1. Inclusion Criteria

The 2022 GDHS utilized a male-specific survey to gather data from eligible individuals aged 15 to 59 residing in 17,933 households in Ghana. This study only included adolescents and young adult men aged 15 to 24 years who consented to participate and completed the study from this population in Ghana.

2.3.2. Exclusion Criteria

The following were excluded in this study: 1) men under 15 and 25 years and older; and 2) women in Ghana.

2.4. Sample Size and Sampling Procedures

The 2022 GDHS adopted the updated sampling framework devised by GSS, utilizing data from the 2021 Population and Housing Census, with interviews conducted among 17,933 households involving 7044 men aged 15 to 59 [21]. In the current study, 2453 adolescents and young adults aged 15 - 24 years in Ghana were selected and included in the analysis.

The 2022 GDHS utilized a stratified two-stage cluster sampling technique to ensure the generation of nationally representative data encompassing urban and rural areas, as well as all 16 regions, covering diverse DHS indicators. Initially, 618 target clusters were chosen in the first stage using probability proportional to size (PPS) for both urban and rural areas within each region. Subsequently, an equal number of clusters were selected through systematic random sampling from those identified in the first phase, ensuring representation across urban and rural areas in each region. Following cluster selection, an extensive household list-

ing and mapping operation was conducted in all selected clusters to create a comprehensive roster of households, which served as the sampling frame for household selection. To ensure the accuracy of this process, the Ghana Statistical Service (GSS) organized a 5-day training course on listing procedures for the appointed listers and mappers, with support from ICF. These personnel were divided into 25 teams, each consisting of one lister and one mapper, tasked with completing the listing operation over a two-month period. Alongside household listing, listers also recorded the geographical coordinates of each household using GPS dongles provided by ICF, adhering to guidelines outlined in the DHS Listing Manual. Tablet computers equipped with software from The DHS Program facilitated the household listing process. Finally, 30 households were randomly selected from each cluster for an interview, ensuring a standardized approach to data collection.

2.5. Data Quality Control

The Demographic and Health Survey (DHS) administered a pretest before gathering data, followed by a debriefing session with the pretest field workers. The Ghana Statistical Service (GSS) confirmed the accurate collection and documentation of data protocols. Subsequent adjustments to the questionnaires were made as necessary. The questionnaires were then definitively translated into three local languages—Twi, Ga, and Ewe. To ensure precision, independent individuals conducted back translations into English. Any translation issues were resolved before the scheduled training of trainers and the pretest. After finalizing the questionnaires, ICF staff worked with GSS staff to develop Interviewer and Supervisor/Editor's Manuals, as well as fieldwork control forms for monitoring survey progress. These manuals provide guidance to interviewers and supervisors/editors, clarifying the purpose of various questions and sections of the questionnaires, and assisting trainers in conducting pretest and main survey training sessions. More details on the data-collection process can be found at <https://www.dhsprogram.com/>.

2.6. Ethical Considerations

On November 27th, 2023, permission to use the GDHS datasets was obtained from the Department of Health and Human Services (DHS) Inner City Fund International (ICF). The study was conducted with high ethical considerations while adhering to established protocols. A summarized report of the 2022 Ghana DHS data by the GSS is available at <https://www.dhsprogram.com/>. Initially, the GSS submitted the survey protocol to the Ethical Review Committee (ERC) of the Ghana Health Service to ensure compliance with Ghana's ethical research standards, and the ERC granted ethical clearance for the survey. Similarly, ICF submitted the GDHS survey protocol to the ICF Institutional Review Board (IRB) to obtain ethical clearance, ensuring alignment with US and international ethical research standards, and the IRB approved ethical clearance for the survey. The Department of Health and Human Services (DHHS) Inner City Fund International (ICF) gave approval on November 27th, 2023 through approval number 193342.

Throughout the study, data confidentiality was strictly maintained. Ethical considerations, including informed consent, confidentiality, and privacy, were addressed by the DHS office. There was no manipulation of the microdata beyond the scope of this study, and there was no involvement of patients or the public, thus adhering to the principles of the Declaration of Helsinki.

2.7. Data Analysis

In the present study, we conducted descriptive statistics by computing and tabulating frequencies and proportions of the socio-demographic variables due to the categorical nature of the variables. A binary logistic regression analysis was conducted to ascertain the relationship between the dependent variables, and independent variables among adolescents and young adults' men in Ghana. To determine the probability or likelihood of an association between these variables, the odds ratios (OR) and 95% confidence interval were computed. The IBM Statistical Package for the Social Sciences (IBM SPSS version 29) was adopted in analyzing the data, while the statistical significance was set at $p < 0.05$.

2.8. Measures

2.8.1. Dependent Variables

The dependent variable assessed in this study was condom use behavior. This variable was evaluated through the participant's use of condom every time they had sex with the most recent partner in the last 12 months thus, "was a condom used every time you had sexual intercourse with this person (sexual partner) in the last 12 months?" This variable was coded dichotomously as "yes" or "no".

2.8.2. Independent Variables

Sexual correlates (sexual activity, multiple sexual partnerships, STIs, genital sores, and genital discharge) were chosen because of their dominance in the literature and their availability in the DHS dataset. Sexual activity was measured by asking the participants: "I would like to ask you about your recent sexual activity. When was the last time you had sexual intercourse?" This was originally coded as 0 = Never had sex, 1 = Active in the last four weeks, while 2 = Not active in the last four weeks. In this study, this variable was re-coded as 0 = No (Never had sex) and 1 = Yes (Active in last four weeks and not active in last four weeks). Similarly, Multiple sexual partnerships (i.e. sexual partners excluding spouse), were assessed by asking the participants; "In total, with how many different people have you had sexual intercourse with excluding your spouse?" This was coded as 0 = No (none) and 1 = Yes (1 or more). Furthermore, if the participants had any STI in the last 12 months was assessed by asking a question about their health in the last 12 months thus, "During the last 12 months, have you had a disease which you got through sexual contact?". This was coded dichotomously as, 0 = No, 1 = Yes. Likewise, having genital sores was measured by asking, "sometimes men have a sore or ulcer near their penis. During the last 12 months, have you had a sore or ulcer on or near your penis? This was coded dichotomously as, 0 = No, 1 = Yes. Lastly,

genital discharge was measured by asking, “Sometimes men experience an abnormal discharge from their penis. During the last 12 months, have you had an abnormal discharge from your penis? This variable was also coded dichotomously as, 0 = No, 1 = Yes.

3. Results

3.1. Sociodemographic Characteristics of the Study Participant

Table 1 illustrates that the AYA population (N = 2453) predominantly comprised participants originating from Savannah (8%), Ashanti (7.8%), Oti (7.3%), Central (7.3%), Northern (7.2%), and Upper East (7%). The majority of participants were sourced from rural areas (54.5%), aged between 15 and 19 years (58.3%), overwhelmingly unmarried (92.1%), with primary/Middle/JSS education (57.3%), engaged in employment (64.1%), and identified as Christian (64.9%). Nearly an equal proportion of participants reported being sexually active (49%), with the remainder (51%) indicating no sexual activity. Furthermore, 34.3% engaged in multiple sexual partnerships with at least one sexual partner and above, however, only 6.8% had experienced an STI, 4.9% a genital sore, and 8.0% a genital discharge. Finally, only 20.7% reported the use of a condom during sexual activity (see **Table 1**).

Table 1. Sociodemographic characteristics of the participants (N = 2453).

Variables	N	%
Region		
Western	144	5.9
Central	180	7.3
Greater Accra	129	5.3
Volta	110	4.5
Eastern	131	5.3
Ashanti	192	7.8
Western North	136	5.5
Ahafo	125	5.1
Bono	122	5.0
Bono East	161	6.6
Oti	179	7.3
Northern	177	7.2
Savannah	197	8.0
North East	153	6.2
Upper East	172	7.0
Upper West	145	5.9
Resident Type		
Urban	1115	45.5
Rural	1338	54.5

Continued

Age Group (Years)		
15 - 19	1430	58.3
20 - 24	1023	41.7
Marital Status		
Never Married	2258	92.1
Married	111	4.5
Cohabitation	62	2.5
Widowed/Separated/Divorced	22	0.9
Education		
No Education/Don't Know/Pre-primary	176	7.2
Primary/Middle/JSS	1406	57.3
Secondary/SSS/SHS	735	30
Higher	136	5.5
Employment		
Not Employed	881	35.9
Employed	1572	64.1
Religion		
Traditionalist/Spiritualist/No religion	186	7.6
Christian	1591	64.9
Islam	676	27.6
Sexual Activity		
Never had sex	1250	51
Sexually Active	1203	49
Multiple Sexual Partners		
No	1612	65.7
Yes	841	34.3
Had any STI in last 12months		
No	2286	93.2
Yes	167	6.8
Had Genital Sores		
No	2333	95.1
Yes	120	4.9
Had Genital Discharge		
No	2256	92.0
Yes	197	8.0
Condom Use		
No	954	79.3
Yes	249	20.7

3.2. The Association between Sexual Correlates and Condom Use Behaviors

The *Chi-Square test results* showing the association between sexual correlates (sexual activity, multiple sexual partnerships, having an STI, genital sores, genital discharge), and condom use behavior are presented in **Table 2**. The findings indicate that only 19.3% of sexually active participants (786) utilized a condom during the last sexual intercourse. Similarly, only 29% of participants who engaged in multiple sexual partnerships (841) used a condom during their last sexual intercourse. Likewise, only 21.6% of participants with a history of STIs, 12.5% of participants with a history of genital sores, and only 21.3% of participants with a history of genital discharge, utilized condom during their last sexual intercourse. Overall, engaging in multiple sexual partnerships ($P < 0.001$), and having a history of genital sores ($P = 0.019$) were significantly associated with condom utilization (see **Table 2**).

Table 2. Chi-Square test showing the association between sex-related experiences and condom use behavior.

Variables	Condom Use		Total
	No	Yes	
	N (%)	N (%)	
Sexual Activity			$P = 0.110$
No	320 (76.7)	97 (23.3)	417
Yes	634 (80.7)	152 (19.3)	786
Multiple Sexual Partnerships			$P < 0.001$
No	357 (98.6)	5 (1.4)	362
Yes	597 (71.0)	244 (29.0)	841
Had Sexually Transmitted Infections (STIs)			$P = 0.768$
No	823 (79.4)	213 (20.6)	1036
Yes	131 (78.4)	36 (21.6)	167
Had Genital Sores			$P = 0.019$
No	849 (78.4)	234 (21.6)	1083
Yes	105 (87.5)	15 (12.5)	120
Had Genital Discharge			$P = 0.814$
No	799 (79.4)	207 (20.6)	1006
Yes	155 (78.7)	42 (21.3)	197

Note: Chi-square tests (cross tabulations) were used to calculate the prevalence estimates and the Association between Sex-Related Correlates or Experiences and Condom Use Behavior. P stands for p-value set at a significance value of $\alpha = 0.05$.

3.3. The Relationship Between Sexual Correlates and Condom Use Behaviors

The *binary logistic regression analysis* findings (Model I) showing the relationship

between sexual correlates (sexual activity, multiple sexual partnerships, having an STI, genital sores, genital discharge), and condom use behaviors are summarized in **Table 3**. The results of the *logistic regression model* indicate that there were significantly higher odds of condom utilization among participants who engaged in multiple sexual partnerships (AOR = 29.87, 95% CI = 12.19 - 73.21, $P < 0.001$) outside their spouse than participants who had only one sexual partner (their spouse) or were never in any sexual relationships (see **Table 3**). Likewise, there were higher odds of condom utilization among participants with a history of genital discharge (AOR = 1.28, 95% CI = 0.73 - 2.24, $P = 0.396$) than those who had no history of genital discharge. Overall, just like the Chi-square test, the logistic regression results indicate that having a history of genital sores ($P = 0.013$) was significantly associated with condom utilization (see **Table 3**).

Table 3. Logistic regression analysis test showing the relationship between sex-related experiences and condom use behavior.

Variables	Model 1 Condom Use Behavior AOR, 95% CI	P-Value
Sexual Activity		$P = 0.110$
No	Ref	
Yes	0.79 (0.59 - 1.06)	
Multiple Sexual Partners		$P < 0.001$
No	Ref	
Yes	29.87 (12.19 - 73.21)	
Had Sexually Transmitted Infections (STIs)		$P = 0.562$
No	Ref	
Yes	0.84 (0.46 - 1.52)	
Had Genital Sores		$P = 0.013$
No	Ref	
Yes	0.44 (0.23 - 0.84)	
Had Genital Discharge		$P = 0.396$
No	Ref	
Yes	1.28 (0.73 - 2.24)	

AOR = Adjusted Odd Ratio, CI = Confidence Intervals, Model 1 = Condom use behavior is analyzed as an outcome variable. P stands for *P*-value set at a significance value of $\alpha = 0.05$.

4. Discussion

This nationally representative cross-sectional secondary study aimed to address the prevalence of sexual correlates related to condom use among Ghanaian adolescents and young adult (AYA) men aged 15 - 24, as well as the interplay between

these factors and condom use within this demographic. Utilizing the latest data from the Ghana Demographic and Health Survey (GDHS), the study sought to address gaps in understanding the current sexual health behaviors of young Ghanaian men.

The majority of participants hailed from regions like Savannah, Ashanti, Oti, Central, Northern, and Upper East, predominantly from rural backgrounds. They were mostly aged 15 - 19, unmarried, and had attained primary, middle, or Junior Secondary School education. Additionally, a significant portion were employed and identified as Christian. Nearly half of the participants (49%) were sexually active, yet only 20.7% of sexually active participants reported consistent condom use. These findings suggest that only one-fifth of the participants who may benefit from the protective barrier of condom use actually did so, which is counter-productive for the promotion of safe sexual practices. To promote safer sexual health practices, reduce negative sexual reproductive health outcomes, and increase access to preventive barriers like condoms within this demographic of sexually active AYAs; there is a crucial need to prioritize integrating condom use into all comprehensive public health care services at all levels for male clients above 15 years in Ghana. One way to make condom communication widely available and acceptable is to add condom questions to patient intake forms to prompt deliberations about it during all medical visits by AYA. That way, clinicians and staff will also be prompted to discuss the importance of condom utilization during clinical encounters with AYAs. Studies involving AYAs conducted among various groups have highlighted the importance of condom communication which contributes in addressing the stigma associated with condoms owing to cultural and religious norms [22]-[25]. Some of the effective condom communication strategies between AYAs and parents, healthcare clinicians, and sexual partners are along the lines of possession, exploration, demand, negotiation, and health concerns surrounding condom use behaviors [22] [25] [26]. These strategies should form the thrust of sexual reproductive health policy to encourage safe sex among AYA men in Ghana.

Another noteworthy finding of this study was the significantly higher odds of condom utilization among participants who engaged in multiple sexual partnerships outside their spouse than participants who had only one sexual partner (their spouse) or were never in any sexual relationships. Specifically, this finding aligns with prior research among AYA in Sub-Saharan Africa where multiple sexual partnerships were associated with AYA men and condom use during the last sexual encounter [27] [28]. Multiple sexual partnerships account for the most significant risk factor increasing the HIV transmission rates among sub-Saharan African AYA [29], and given that certain Sub-Saharan African cultural norms associate multiple sexual partnerships among men with proof of virility or social clout [27], there is a need for greater measures addressing it in this demographic. Condom use promotion and consistent messaging regarding the health benefits of single sexual partnerships should be deliberately directed at challenging the misin-

formed structural and community acceptance of multiple sexual partnerships.

4.1. Limitations and Strengths of the Study

This study is built upon a self-report cross-sectional primary GDHS study, potentially influenced by flaws like social desirability bias. This bias could lead participants to underreport or be affected by recall bias, potentially skewing the outcomes. The study's design cannot definitively establish a causal link between condom use and sex-related factors due to its cross-sectional nature. Additionally, the broad or rigorous item pool in the measure used for the youngest age group [15]-[19] may impact their responses. The exclusion of female AYA in Ghana deprives the study of gender implications crucial for a comprehensive evaluation of sexual reproductive health outcomes. Future research should address this by studying both male and female AYAs concurrently to facilitate a better understanding of safe sexual interactions. Despite these limitations, this study represents a significant advancement as the first examination of sexual correlates of condom use among AYA men in Ghana using the latest GDHS data. It offers valuable insights with its large, nationally representative sample size, contributing to HIV prevention evidence in Ghana by focusing on the general AYA male population without segmenting based on behavior, sexual orientation, or gender identity.

4.2. Conclusion

Understanding condom use behavior among AYA men is essential to underpin the sexual behaviors and norms that shape adult life and influence both behavior and health. This study has outlined the under-utilization of condoms that is common among AYA men aged 15 - 24 years old in Ghana. Several sex-related correlates, particularly multiple sexual partnerships and a history of genital sores have some significant correlation with condom use behavior. Initiatives targeting the reduction of adverse sexual reproductive health outcomes should prioritize expanding safe-sex behavioral interventions and communication strategies focused on ensuring the consistent accessibility of condoms for young men with a history of multiple sexual encounters; thereby encouraging regular condom usage in Ghana.

Consent for Publication

The authors conducted the final revision prior to final manuscript submission.

Availability of Data and Materials

All data for this study are provided in this document, and the comprehensive dataset is freely available through the <https://app.grammarly.com/> website.

Authors' Contributions

All authors conceptualized the article, wrote the initial draft of the article, reviewed the article and submitted the manuscript.

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Conflicts of Interest

The authors declare that they have no competing interests.

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