Patterns And Correlates Of Substance Use: Cross Sectional Exploratory Study Among Health Care Workers In Bungoma County, Kenya

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Short Report

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ORIGINAL PAPER;

**PATTERNS AND CORRELATES OF SUBSTANCE USE: CROSS SECTIONAL
EXPLORATORY STUDY AMONG HEALTH CARE WORKERS IN BUNGOMA
COUNTY, KENYA**

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Abstract

Background: This was a cross sectional exploratory study that examined data obtained from health care workers on substance use in Bungoma County Kenya.

Methods: This was a cross sectional exploratory study in selected health facilities in three sub counties of Bungoma County. This study used a two-stage cluster sampling technique and systematic sampling to select the respondents. The study sample was (N= 237) among health care workers in selected facilities in 3 sub counties of Bungoma county .The study response rate was 96.3 %(237/247) . Self-reported data on substance use during their lifetime, use in the past 12 months and past 30 days was used as key parameters to determine patterns and correlates of substance

Results: As compared with females, males were found to have a greater like hood of substance use, having family member with a history of substance use and a colleague who uses substances were key predictors for substance use. Substance use prevalence without generalization to the population of Health care workers (HCWs) in this study shows a high prevalence of lifetime substance use (35.02, 29.17- 41.36) concurs with findings in a study in Machakos and Nairobi (Mokaya et al 2018). Alcohol had the highest lifetime prevalence rate (33%)

Conclusion; Alcohol use among HCW had the highest prevalence with socio-demographic factors on gender, family and peer influence associated with substance use among health workers. The study findings suggest preventive interventions against substance use are required at family level and among peers. Further research is needed on substance abuse, dependence, reasons for substance use and how it affects health workers performance

Keywords: Substance Use, abuse, dependence, patterns, correlates, lifetime use

Background

Substance use is defined as the practice of using at least one of the substances such as alcohol, cigarettes, and licit or illicit drugs with the aim of enjoying the pleasurable effects of the psychoactive properties which comes with associated risks of addiction [1]

Substance abuse on the other hand is defined as the harmful or hazardous use of psychoactive substances, including alcohol and/or illicit drugs in a manner that jeopardizes one's health despite knowledge of its dangers. Abuse, may be for both licit and illicit substances and may lead to substance use disorder (SUD) such as dependence which is a compulsive craving behaviour that persists despite known consequences [2]

Substance use is a global problem causing 39 deaths per 100 000 population out of which 35 deaths are attributable to alcohol use while four are attributable to illicit drug [3]

There is an emergent epidemic of tobacco, heroine and alcohol use among adolescent in Sub-Saharan Africa (Olawole-Isaac, *et al.*, 2018) with illegal substance consumption responsible for 37,000 people dying annually from illegal drug consumption related illnesses [4]

The estimate of substance use among adolescents in Sub-Saharan Africa was found to be 41.6% (95% CI 31.3-51.9) with Central Africa taking the lead with 55.5% (95%-CI-53-58) followed by East Africa with 48.99%(95%-CI-28.8-69.2) and the least in Southern Africa at 37% (95% CI 16.1-57.8) [5]

The Government of Kenya acknowledged substance abuse as a matter of national concern, and through a Legal Notice established the National Agency for Coordination of Drug & Substance abuse tasked with the responsibility to spearhead the campaign against substance

use (NACADA, 2009). The Ministry of health indicate that the most commonly used drugs in Kenya are nicotine, alcohol and cannabis. [6]

Substance abuse in Kenya has snowballed and manifested itself in different facets in the socio-economic arena. [7] In the recent past, 59% of employees in Kenya had taken alcohol with 25% being hospitalized due to alcohol related complications. [8]

A healthcare personnel survey conducted in 2005 in Kenya, found out that four in ten healthcare personnel, had drunk alcohol with an estimate 13% of health personnel in virtually all provinces except North Eastern province being consumers of alcohol [8]

This is a pointer to a pervasive and silent problem that poses the danger of negatively affecting not only the health and well-being of health workers but have detrimental effects in terms of employee's performance and productivity, yet, health professionals have an ethical responsibility to offer the best available medical care to their patients [9]

However, there is limited data on the socio-demographic and psycho-social factors influencing involvement in substance use, prevalence rates, patterns and types of substances use and the accessibility of substance by health workers.

Substance use problem if not addressed poses the danger of abuse and dependence negatively affect efficiency of employees in their work performance [10] bringing with it serious socio-economic barriers [8] and eventually become an immense challenge to growth and development [11]

Recent studies, indicate the prevalence of substance abuse not higher in healthcare professionals (HPs) than the general population, however, given the obligation health workers owes to the public, any impairment due to substance use disorder among them could

place the public at increased risk due to errors health workers could perform while providing treatment [12]

Therefore this study was the first step in obtaining in-depth information on the patterns and correlates of substance use aimed to facilitate the development of tailor made educational and intervention strategies.

The study was conducted in health facilities in three selected sub counties of Bungoma County. It was reported as the county with the highest access to traditional liquor [13] and an upsurge in use of traditional liquor (*busaa*) and *chang'aa* [6]. Also recent study found 90% of household having at least one member who abuse one substance. [14]

The purpose of the study was to determine patterns and correlates of substance use among health workers in Bungoma County, Kenya. The specific objectives was to determine the socio-demographic and physco-social factors associated with substance use; estimate the prevalence of substance use and identify the pattern of substance use.

Methods

Participants

This study was carried out in 21 health facilities in three sub counties of Bungoma county. Data for this study was obtained through a cross sectional study among health care workers. Study participants were enlisted using systematic random sampling and interviewed between February-March 2019. Seven health facilities(composed of 1 bigger hospital , 3 health centres and 3 dispensaries) were sampled using lottery method(random generator) Self-administered questionnaires and interview guide were used to collect data on patterns and correlated of substance use

A total of 237 out of the 246 health workers targeted, completed the questionnaire giving a response rate of 96.3% with the highest response recorded in Bungoma South (97.7 %) Mt Elgon (97.1%) , and 80.1% in Bungoma West.

Measures

The demographic measure included age (spit into age category 20-24-25-29, 30-34 and above 35 years of age), gender, level of education, marital status, occupation, profession, cadre, family history of substance use, work colleague history of substance use and history of stressful events at home and at workplace. Respondent were asked a series of question about substance use in their lifetime, in the past 12 months and in the past 30 days.

Statistical Analysis

Descriptive analysis was done on the cleaned and complete data and Fischer's exact test and logistic regression model used to test the association of socio-demographic factors and correlates of substance use. Data was cleaned and coded before analysis using STATA version 14.2. Participant characteristics and prevalence of substance use were presented by use of frequencies and percentages for categorical variables.

During the analysis logistic regression was used to examine association between socio-demographic and psych-social factors and correlates of substance use, use in the lifetime, use in the last 12 months and use in the last 30 days .Bivariate analysis was applied in the first phase. The second phase entailed the use of multivariate regression analysis where variables with a $p < 0.2$ in the bivariate phase were fit in the multivariate model with backward regression used to fit the significant variables in the final model. Associations were reported by use of adjusted odds ratios (AOR). Statistical significance was considered for $p < 0.05$ using Fischers exact test.

Results

Socio-Demographic and Psycho social factors associated with Substance Use

The study found out that sex, use of a substance by family member and use by colleague were determinants of lifetime substance use.

Table 1.1. Participant Socio-Demographic Characteristics

Variables Characteristic (n=237)	N	%
Sub County		
Bungoma South	157	66.24
Bungoma West	14	5.91
Mt. Elgon	66	27.85
Sex (n=236)		
Female	136	57.63
Male	100	42.37
Age (n=231)		
19 -24	24	10.39
25-34	127	54.98
35 +	80	34.63
Marital Status		
Single	54	22.78
Married	174	73.42
Separated/Widowed	9	3.80
Education Level (n=233)		
School Certificate	19	8.15
Professional Certificate	33	14.16
Diploma	128	54.94
Degree	32	13.73
Postgraduate Diploma	17	7.30
Postgraduate Degree	4	1.72
Religion (n = 235)		
Christian	220	88.9
Muslim	15	6.36
Other Religion	11	4.66
Occupation (n = 231)		
Clinical Staff	166	71.86
Non-Clinical Staff	65	28.14
Work unit (n = 229)		
Preventive & Curative	168	73.36
Diagnostic Care	22	9.61
Rehabilitative Care	10	4.37

	Auxillary Support Care	29	12.66
Employment Length (n=224)	1 - 5 yrs	137	61.16
	6 - 10 yrs	42	18.75
	11 + yrs	45	20.09
Spouse Employment	Employed	109	62.64
	Unemployed	65	37.36

Table 1.2 Substance use by Socio-demographic & Psycho-social Factors Associated with Substance use

Characteristic		Bivariate Analysis			Multivariate Analysis	
Characteristic	N	Prevalence n(%)	uOR (95% CI)	*p value	aOR (95% CI)	*p value
Sub County				0.068		
Bungoma South	157	47 (29.94)	<i>ref.</i>		<i>ref.</i>	
Bungoma West	14	7 (50.00)	2.34 (0.78-7.04)	0.13	1.53 (0.35 - 6.59)	0.572
Mt. Elgon	66	29 (43.94)	1.83 (1.01-3.32)	0.045	1.30 (0.58 - 2.88)	0.521
Sex				<0.01		
Female	136	31 (22.79)	<i>ref.</i>		<i>ref.</i>	
Male	100	51 (51.00)	3.53 (2.01-6.18)		4.16 (2.02 - 8.57)	< 0.001
Age				0.772		
19 -24	24	10 (41.67)	<i>ref.</i>			
25-34	127	44 (34.65)	0.74 (0.30-1.81)	0.511		
35 +	80	27 (33.75)	0.71 (0.28-1.82)	0.478		
Marital Status				0.216		
Single	54	21(38.89)	<i>ref.</i>			
Married	174	61 (35.06)	0.85 (0.45-1.59)	0.608		
Separated/Widowed	9	1 (11.11)	0.20 (0.02-1.69)	0.138		
Education Level				0.307		
School Certificate	19	3 (15.79)	<i>ref.</i>			
Professional Certificate	33	9 (27.27)	2.00 (0.47-8.54)	0.349		
Diploma	128	47 (36.72)	3.09 (0.86-11.18)	0.085		
Degree	32	14 (43.75)	4.15 (1.01-17.11)	0.054		
Postgraduate Diploma	17	6 (35.29)	2.91 (0.60-14.18)	0.186		
Postgraduate Degree	4	2 (50.00)	5.33 (0.53-54.03)	0.157		
Religion				0.895		
Christian	220	77 (35.00)	<i>ref.</i>			
Muslim/Hindu	15	5 (33.33)	0.93 (0.31-2.82)			

Occupation					0.742
Clinical Staff	166	60 (36.14)	<i>ref.</i>		
Non-Clinical Staff	65	22 (33.85)	0.90 (0.49-1.65)		
Work unit					0.56
Preventive & Curative	168	57 (33.93)	<i>ref.</i>		
Diagnostic Care	22	9 (40.91)	1.35 (0.54-3.34)	0.519	
Rehabilitative Care	10	5 (50.00)	1.95 (0.54-7.00)	0.308	
Auxiliary Support Care	29	8 (27.59)	0.74 (0.31-1.78)	0.503	

Significant results are presented in bold fonts

uOR= Unadjusted Odd Ratio aOR= Adjusted Odd Ratio

* Fischer exact test

Table 1. 3. Substance use and Socio-demographic & Physco-social factors

Characteristic			Bivariate Analysis		Multivariate Analysis	
Characteristic	N	Prevalence n(%)	uOR (95% CI)	* <i>p</i> value	aOR (95% CI)	* <i>p</i> value
Employment Length				0.817		
1 - 5 yrs	137	45 (32.85)	<i>ref.</i>			
6 - 10 yrs	42	15 (35.71)	1.14 (0.55-2.34)	0.731		
11 + yrs	45	17 (37.78)	1.24 (0.62 - 2.50)	0.545		
Termsof Employment				0.0533		
Permanent & Pensionable	133	53 (39.85)	<i>ref.</i>		<i>ref.</i>	
Temporary/Fixed	72	25 (34.72)	0.80 (0.44-1.46)	0.471	0.92 (0.41- 2.06)	0.848
Casually Employed	21	3 (14.29)	0.25 (0.07-0.90)	0.033	0.46 (0.10- 2.01)	0.3
Spouse Employment				0.3289		
Employed	109	34 (31.19)	<i>ref.</i>			
Unemployed	65	25 (38.46)	1.38 (0.72 - 2.62)			
Substance Use by Family Member				<0.001		
No	118	25 (21.19)	<i>ref.</i>		<i>ref.</i>	
Yes	111	55 (49.55)	3.65 (2.05 - 6.51)		2.88 (1.33 - 6.21)	0.007
Substance Use by Colleagues				<0.001		
No	84	10 (11.90)	<i>ref.</i>		<i>ref.</i>	
Yes	113	58 (51.33)	7.80 (3.66 -	<0.001	4.59 (1.95 -	<0.001

Don't Know	27	10 (37.04)	16.62) 4.35 (1.56 - 12.10)	0.005	10.83) 1.57 (0.41- 5.93)	0.508
Ever experienced stressful event				<0.001		
No	74	13 (17.57)	<i>ref.</i>		<i>ref.</i>	
Yes	141	60 (42.55)	3.48 (1.75-6.90)		1.77 (0.73-4.29)	0.206

Significant results are presented in bold fonts uOR= Unadjusted Odd Ratio aOR= Adjusted Odd Ratio

* Fischer exact test

This study found that HCW with a family member who uses a substance was associated with lifetime substance use (Table 1.3)

Similar observations were observed on substance use in the past 12 months. A higher proportion of male health care workers were found to have ever used all substances in the past 12 months in comparison to females. Significant difference was observed in alcohol and tobacco use.

Prevalence of Substance Use

The study's second objective was to determine the prevalence of substance use. Prevalence was calculated based on the sample with the characteristic of interest (Ever used substance in lifetime). It was found that slightly more than a third of the participants had reported lifetime use of a substance (83, 35.02%). Alcohol was the most used substance (78, 33.05%), followed by tobacco (21, 8.9%) and Khat (13, 5.51%). The quantitative results are supported by focus group discussions on the prevalence of substance use as shown in the excerpt:

"The problem is with us we cannot give names, we are grappling with the problem among our staff" HMT Member, Bungoma South sub County. *"Several staff do involve in substance use one way or the other, due to the stressful work environment"* HMT Member, Mt. Elgon sub County.

Patterns of Substance Use among health workers

The patterns of Substance use was considered based on the ASSIST tool whereby substance use was considered with history of use in a lifetime, in the past 12 months and in the past 60 days

It was found that slightly more than a third of the participants had reported lifetime use of a substance (83, 35.02%). Alcohol was the most used substance (78, 33.05%), followed by tobacco (21, 8.9%) and Khat (13, 5.51%). Table 1.4.

Substance use rate in the past one month was relatively higher among male HCWs compared to the female HCWs for all categories apart from the inhalant solvents with significant difference observed for alcohol and tobacco use. Similar findings were observed on studies done on Health Care Workers [16] and the general population [7]

This study reported less than 25% of alcohol use and less than 5% of other substance use for the past 12 and one month. The study findings on alcohol use by HCWs was similar to a study done in Kenya [16] and Ethiopia among undergraduate medical students that reported alcohol use prevalence of 22% [15].

Table 1.4. Lifetime Prevalence of Substances Use Categorized by type of Substance used

Characteristic (n=237)	N	% (95% CI)
Ever Used any substance?		
No	154	64.98 (58.64-70.83)
Yes	83	35.02 (29.17- 41.36)
Alcohol (n=236)		
No	158	66.95 (62.07-74.11)
Yes	78	33.05 (25.89-37.93)
Tobacco (n=236)		
No	215	91.1 (87.43-94.71)
Yes	21	8.9 (5.29-12.57)
Inhalants/Solvents(sniffing) (n=236)		
No	232	98.31 (96.02-99.58)
Yes	4	1.69 (0.42-3.98)
Khat (n=236)		
No	223	94.49 (91.57-97.35)
Yes	13	5.51 (2.64-8.43)
**Prescription Drugs (n=236)		
No	225	95.34 (92.11-97.67)
Yes	11	4.66 (2.33-7.89)
Illicit hard drugs(Bhang, marijuana (n=236)		
No	227	96.19 (93.20-98.27)
Yes	9	3.81 (1.73-6.80)
Other Drugs (n=231)		
No	228	98.7 (96.02-99.58)
Yes	3	1.3 (0.42-3.98)

Participants were asked to indicate whether they had ingested any of the substances in their lifetime which included Alcohol ,Tobacco products, Inhalants solvents,

Prescription drugs (for NonMedical use), Khat, Bhang and Other drugs

**Prescription drugs(depressant and stimulant used for non-medical purpose)

Table 1.5. Substance use in the lifetime among HCWs and its association by gender

Characteristic	Gender		Gender		Bivariate analysis
	N	%	Female	Male	
Alcohol					*p value
No	158	67.2	106 (67.1%)	52 (32.9)	<0.001
Yes	77	32.8	29 (37.6%)	48 (62.3%)	
Tobacco (smoking/ ingestion)					0.0009
No	214	91.1	131(61.2%)	83(38.8%)	0.9457
Yes	21	8.9	17(80.9%)	4(19.0%)	
Inhalants/Solvents(sniffing)					0.0065
No	232	98.3	133(56.1%)	98(41.3%)	
Yes	4	1.7	2(0.84%)	2(0.84%)	0.1125
MiraaKhat(chewable stimulant)					
No	222	94.5	133 (59.9%)	89 (40.1%)	0.0901
Yes	13	5.5	2(15.3%)	11(84.6%)	
**Prescription Drugs					0.6904
No	225	95.3	132(55.9%)	92(38.9%)	
Yes	11	4.7	2(0.84%)	8(3.3%)	0.0901
Illicit hard drugs(Bhang, marijuana)					
No	227	98.7	133(56.3%)	93(39.4%)	0.6904
Yes	3	1.3	2(0.84%)	7(2.9%)	
Other Drugs					0.6904
No	227	98.7	131 (57.7%)	96 (42.3%)	
Yes	3	1.3	2 (0.84%)	1 (0.4%)	

* Fischer exact test

**Prescription drugs(depressant and stimulant used for non medical purpose)

Substance Use in the Past 12 Months

The type of substances used in the past 12 months were alcohol 49 (20.85%), prescription drug 8 (3.43%) and Tobacco 8 (3.42%) and Khat use 6 (2.56%) (Table 1.6). All the substances were found to be used mostly by men as compared to women. However statistical significance difference was observed among those who used alcohol ($p < 0.001$) and tobacco ($p = 0.011$) (Table 1.6)

Table 1.6. Substance use in the past 12 months stratified by Gender

Characteristic	Total		Female	Male	Bivariate analysis
	N	%	n(%)	n(%)	* <i>p value</i>
Alcohol					<0.001
No	185	79.06	117 (63.24)	68 (36.76)	
Yes	49	20.94	17 (34.69)	32 (65.31)	
Tobacco (smoking/ ingestion)					0.009
No	225	96.57	133 (59.11)	92 (40.89)	
Yes	8	3.43	1 (12.50)	7 (87.50)	
Inhalants/Solvents(sniffing)					0.394
No	230	98.71	133 (57.83)	97 (42.17)	
Yes	3	1.28	1 (33.33)	2 (66.67)	
MiraaKhat(chewable stimulant)					0.043
No	227	97.42	132 (58.15)	95 (41.85)	
Yes	6	2.58	1 (16.67)	5 (83.33)	
**Prescription Drugs					0.06
No	224	96.55	131 (58.48)	93 (41.52)	
Yes	8	3.45	2 (25.00)	6 (75.00)	
Illicit hard drugs(Bhang, marijuana)					0.188
No	230	98.29	133(57.83)	97 (42.17)	
Yes	4	1.71	1 (25.00)	5 (75.00)	
Other Drugs					0.396
No	227	98.7	131 (57.71)	96 (42.29)	
Yes	3	1.3	1 (33.33)	2 (66.67)	

* Fischer exact test

**Prescription drugs(depressant and stimulant used for non medical purpose)

Trends of Substance use in the past 30 Days

Current substance usage was considered for use in the past 30 days. The top three leading types of substances currently used were Alcohol 36 (15.32%), Tobacco 8 (3.40%) and Prescription drugs 4 (1.73%).The rest of substances use had rate of less than 1%.All the substances were found to be used mostly by men as compared to women. However, statistical

significance difference was observed among those who used alcohol ($p < 0.001$) and tobacco ($p = 0.009$). (Table 1.7).

Table 1. 7. Substance use in the past 30 Days by Gender

Characteristic	Total		Female	Male	Bivariate analysis
	N	%	n(%)	n(%)	* <i>p</i> value
Substance Use in past 30 days					
Alcohol					<0.001
No	198	84.62	123 (62.12)	75 (37.88)	
Yes	36	15.38	11 (30.56)	25 (69.44)	
Tobacco					0.009
No	226	96.58	133 (58.85)	93 (41.15)	
Yes	8	3.42	1 (12.50)	7 (87.50)	
Inhalants/Solvents(sniffing)					0.839
No	231	99.14	132 (57.14)	99 (42.86)	
Yes	2	0.86	1 (50.00)	1 (50.00)	
MiraaKhat(chewable stimulant)					0.823
No	230	99.14	133 (57.83)	97 (42.17)	
Yes	2	0.86	1 (50.00)	1 (50.00)	
Prescription Drugs					0.193
No	226	98.26	130 (57.52)	96 (42.48)	
Yes	4	1.74	1 (25.00)	3 (75.00)	
Illicit hard drugs(Bhang, marijuana)					0.835
No	232	99.15	133 (57.33)	99 (42.67)	
Yes	2	0.85	1 (50.00)	1 (50.00)	
Other Drugs					0.838
No	229	99.13	131 (57.21)	98 (42.79)	
Yes	2	0.87	1 (50.00)	1 (50.00)	

* Fischer exact test

Discussion

This study adds to the knowledge on substance use among the health workers in Bungoma county Kenya which was not known. It contributes to the knowledge and highlights the important role of a family in substance use disorder prevention since health care workers who were male were more prone to substance use compared to females. This was consistent with Ding, (2014) assertion that a family member who uses substance has been found to be more likely to influence other members to use substances such as alcohol. Similar findings were observed by a study done in Ethiopia among medical students [15] and in Kenya among HCWs [16]

HCWs with a college degree were found to be associated lifetime substance use during the bivariate analysis compared to those with a certificate course. Similar findings were observed in a study done on HCWs in Kenya [16]. Health care workers who were on casual employment were negatively associated with lifetime substance use compared to the HCWs who were on permanent and pensionable terms. The Kenya national campaign against drug abuse (NACADA) findings reported a higher percentage of high-income group in Kenya reported ever use of substance [7] and corroborates with the study's finding. Similar findings were observed by a study done in Kenya [16]

Limitations

The finding of this study cannot be generalized to the population of health workers in Kenya since it was drawn only from one county to explore patterns and correlates. This study was limited to prevalence and correlates of substance use and did not entail screening for evidence and was also limited in controlling the attitudes of the respondent, since respondents could have given socially acceptable answers to please the researcher (social desirable bias).

Although respondent's confidentiality was assured during the data collection use of self-reporting approach may have influenced the outcome of this study due to the sensitivity of substance use.

Conclusion

Substance use among health workers is prevalent. Alcohol use had the highest prevalence while gender, use of substance by family member and close colleague were associated with substance use and found statistically significant. Socio-demographic factors on age, gender and peer influence was associated with substance among health workers in Bungoma County.

Considering that history of substance use by family member and peers influences substance use, calls for substance use preventive interventions such as sensitization at family level and among peers. The researcher recommends further in-depth study to get insights on substance abuse, dependence, reasons for substance use and how it affects health workers performance.

Declarations

This paper is our original work and has not been presented for a degree in any other university.

Ethics approval and consent to participate

Permission to conduct the research was obtained from the graduate school Kenyatta University, Kenyatta university ethical clearance committee, the National council for science & technology (NACOSTI), and the county health department. The research instruments used were made anonymous and informed consent was sought from each respondent. To mitigate against breach of privacy and ethical concerns, the respondent were assured of privacy and requested to completed the self-report questionnaire individually in a secluded area to prevent

respondents from answering questions as a team. The questionnaires included a statement of reassurance and confidentiality for each respondent.

Consent for publication

The consent for publication was sought from Kenyatta, University Department of Community Health & Epidemiology

Availability of data and materials

The data for the work can be obtained through a formal written request to the author at tkolongei@gmail.com

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Competing interests

The authors declare that they have no competing interests

Authors Contribution

TK Conceived this study and directed the research and conducted the analysis while JO and GC reviewed the manuscript and contributed to the background and writing and wrote the methods section. GC helped in revising the literature

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