Research/Review Article

FEDPOLEL JOURNAL OF APPLIED SCIENCES
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Knowledge about HIV/AIDS among Secondary Schools Students in Rural and Urban Settings

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Abstract

Reports showed that about half of people living with HIV/AIDS all over the world are within the highly productive age of 15 – 49 years. This research therefore is aimed at assessing various factors that are likely to have effect on secondary students' knowledge of HIV/AIDS with a view of helping various governmental and non-governmental agencies making informed decisions in allocation of resources towards campaigns and enlightenments against HIV/AIDS. Structured questionnaires were administered to 500 secondary school students in some selected public secondary schools in two communities (one urban and one rural) in Ondo State. Using chi-square and binary logistic, the results showed that HIV/AIDS status knowledge is significant for all socio-demographic factors considered expect religion and mother's level of education. Students living in rural centres have significantly higher odds of knowing HIV/AIDS status compared to those in urban areas. Location of students (urban or rural) is found to be a significant factor with those in urban areas having more knowledge on hearing about HIV/AIDS among the students. Mather's level of education is another factor that is found to be significant with students whose parents have post-primary education having the highest knowledge percentage. Highest percentage for those that had done HIV/AIDS screening was found among older students and those in SS3. More percentage is also noticed among traditionalist compared to other two main religions. Male students are as well found to have more likelihood of getting screened when compared to their female counterparts. Result also showed that students living in rural areas are about twice more likely to get screened for HIV/AIDS.

1.   INTRODUCTION

That HIV is the most dreadful virus in modern history is not an overstatement. In the last few decades, its numerous effects remain number one challenge to health practitioners all over the world. Efforts from various governmental and non-governmental agencies across the globe are yielding results but more still need to be done in ameliorating effects it has on the population. Leading cause of death due to AIDS is recorded in Sub-Saharan Africa [1]. It is on record that youthful population with about 12.5 million of ages from 1 to 24 years as at 2015 [2] are living with HIV out of 33 million infected people. It is pertinent therefore to research into factors with significant effect on the students' knowledge of HIV/AIDS.

To achieve zero prevalence rate of HIV/AIDS, it is very essential for various governmental and non-governmental agencies to channel resources into sensitization and publicity with special attention to the youths. It is in view of this that this research is directed at identifying various socio-demographic factors that militate against knowledge of HIV/AIDS among students in secondary schools with the aim of ameliorating the menace. The study sampled 500 students in 10 different secondary schools (5 in an urban environment and 5 in rural environment) in Ondo

State, South-West of Nigeria. Having adequate knowledge about the scourge will not only help in reducing the ever increasing rate of infection but also ensure that young populations are well equipped with associated challenges posed by the disease. HIV/AIDS affects individuals in particular and nations at large by ultimately life threatening symptoms and premature deaths at productive ages [3]. At older ages, researches [4,5] had shown that knowledge about HIV/AIDS have not brought about the much desired change in the prevalence rate with Uganda and South Africa accounting for over 50% newly reported cases of new infection in the Sub-Saharan Africa and about 70% new cases in West Africa come from Nigeria alone [1]. According to [1], just above 30% of adults in Nigeria that are HIV positive truly know their status with about 15% of the productive age (15 years to 49 years) of the entire populace having sincere knowledge of their status [6].

With obvious relevance of adequate HIV counselling and testing, reports [8,9] had shown that access remain very low. Based on this, efforts in this research in geared towards identifying various factors that may likely have effects on the knowledge of HIV/AIDS at younger age in order to nip the multi-hydra challenges associating with the disease at early stage of life.

2.   MATERIALS AND METHOD

Structured questionnaires were administered to students from two localities (Ile-Oluji and Ondo) in Ondo State. The self-administered study questionnaire is divided into two segments. The first part deals with various socio-demographic details of the students while the second segment assesses knowledge about HIV/AIDS. Five secondary schools were randomly selected in each town and equal number of students (50 per school) were selected at each school across the six classes. *Table 1a* illustrate the details of socio-demographic details of respondents. Questions that aim at assessing responses on the students' knowledge about HIV/AIDS (table 4) were asked and percentage responses are noted.

Binary logistic regression has been used to analyse data with binary responses data [2,9,10] to model associations between a binary response variable and multiple explanatory variables. The model is also useful in predicting the probability of the occurrence of an event of interest and odds of the event with reference to other categories of an explanatory variable [11].

If a binary response variable is defined as:

$$Y = \begin{cases} 1, & \text{for a successful outcome} \\ 0, & \text{for a failed outcome} \end{cases}$$ (1)

Fitting a binary logistic regression model involve estimating regression coefficients that predict the probability of the outcome of interest. Linear logistic regression model is generally written in terms of the probability of a positive response, i.e.

$$\pi_i = \frac{\exp(\beta_{i0} + \beta_{i1}x_{i1} + \cdots + \beta_{ip}x_{ip})}{1 + \exp(\beta_{i0} + \beta_{i1}x_{i1} + \cdots + \beta_{ip}x_{ip})}$$ (2)

Where (2) is the probability that the event of interest will occur in the presence of all covariates.

In this research, binary logistic regression is used to assess the demographic details of respondents on three major items (*"ever heard of HIV/AIDS"*, *"ever done HIV/AIDS screening test"*, and *"knowing HIV/AIDS status"*) of the questionnaire.

3.   RESULTS AND DISCUSSIONS

From 500 respondents, table 1a shows that only 136 (27.2%) know their HIV status. Highest percentage of those that know their status is noticed among older students. More males with (31.6% of total male students) know their status compared to female students. Highest status knowledge is noticed among students in *SS3* (the highest class in secondary school) while those in *JS1* (the lowest class in secondary school education) has the least. Students practicing traditional religion have the highest status knowledge percentage while the Christians have the least. Students whose parents have no formal education have the highest percentage knowledge status and those living in rural areas are found to be more aware of their status compared to those living in urban centres. Chi-square analysis of the various factors revealed that HIV status knowledge is significant for all socio-demographic factors considered expect for religion and mother's level of education.

Binary logistic regression of knowing HIV/AIDS status (*table 1b*) showed that *age, gender, class,* and *location* are significant factors. *Female* students have slightly lower non-significant odds for knowing HIV/AIDS status. *SS3* students have significantly highest odds of knowing HIV/AIDS status while *JS1* students have the least. Students in *urban* centre have significantly lower odds of knowing HIV/AIDS status compared to those in the *rural* areas. Students' *Religion* and *parents' level of education* are non-significant factors for knowing HIV/AIDS status.

Table 1a: Socio-demographic characteristics of respondents and ***"knowledge about HIV status"***

Characteristics		Do you know your HIV status?		Chi-Square P-value (a=0.05)
		No n=364(72.8%)	Yes n=136(27.2%)	
Age	**Total (%)**			
10	2(0.4%)	2(100.0%)	0(0.0%)	
11	23(4.6%)	23(100.0%)	0(0.0%)	
12	54(10.8%)	41(75.9%)	13(24.1%)	
13	60(12.0%)	46(76.7%)	14(23.3%)	
14	79(15.8%)	53(67.1%)	26(32.9%)	
15	83(16.6%)	66(79.5%)	17(20.5%)	*0.003**
16	77(15.4%)	53(68.8%)	24(31.2%)	
17	65(13.0%)	47(72.3%)	18(27.7%)	
18	38(7.6%)	25(65.8%)	13(34.2%)	
19	12(2.4%)	7(58.3%)	5(41.7%)	
20	6(1.2%)	1(16.7%)	5(83.3%)	
23	1(0.2%)	0(0.0%)	1(100.0%)	
Gender	**Total (%)**			
Male	244(48.8%)	167(68.4%)	77(31.6%)	*0.033**
Female	256(51.2%)	197(77.0%)	59(23.0%)	
Class	**Total (%)**			
JS1	80(16.0%)	78(97.5%)	2(2.5%)	
JS2	80(16.0%)	57(71.3%)	23(28.8%)	
JS3	80(16.0%)	53(66.3%)	27(33.8%)	*0.000**
SS1	80(16.0%)	60(75.0%)	20(25.0%)	
SS2	80(16.0%)	68(85.0%)	12(15.0%)	
SS3	100(20.0%)	48(48.0%)	52(52.0%)	
Religion	**Total (%)**			
Christianity	392(78.4%)	294(75.0%)	98(25.0%)	0.088
Islam	99(19.8%)	65(65.7%)	34(34.3%)	
Traditional	9(1.8%)	5(55.6%)	4(44.4%)	

Mother's level of education	Total (%)			
No formal education	36(7.2%)	22(61.1%)	14(38.9%)	
Primary	100(20.0%)	67(67.0%)	33(33.0%)	0.062
Post-Primary	364(72.8%)	275(75.5%)	89(24.5%)	
Father's level of education	**Total (%)**			
No formal education	38(7.6%)	18(47.4%)	20(52.6%)	
Primary	76(15.2%)	56(73.7%)	20(26.3%)	*0.001**
Post-Primary	386(77.8%)	290(75.1)	96(24.9%)	
Location	**Total (%)**			
Rural	250(50.0%)	151(60.4%)	99(39.6%)	*0.000**
Urban	250(50.0%)	213(85.2%)	37(14.8%)	

Source: *2019 Survey*   **Significant factors at a = 0.05*

Table 1b: Logistic regression of ***"knowing HIV/AIDS status"*** on socio-demographic factors

Factor	Std Err.	P-value	OR	95% C.I. for OR
Age	0.101	0.026*	1.251	(1.027,1.524)
Gender				
Male (reference category)			1.000	
Female	0.247	0.070	0.639	(0.394,0.1.037)
Class		0.000*		
JS1 (reference category)			1.000	
JS2	0.784	0.001*	12.960	(2.788,60.237)
JS3	0.780	0.000*	17.448	(3.779,80.550)
SS1	0.831	0.021*	6.788	(1.332,34.600)
SS2	0.866	0.153	3.447	(0.631,18.835)
SS3	0.873	0.000*	22.709	(4.107,125.582)
Religion		0.771		
Christianity (reference category)			1.000	
Islam	0.294	0.572	0.847	(0.476,1.507)
Traditional	0.770	0.596	0.665	(0.147,3.006)
Mother's level of education		0.813		
No formal education (reference category)			1.000	
Primary	0.510	0.566	1.340	(0.493,3.641)
Post-Primary	0.529	0.529	1.395	(0.495,3.931)
Father's level of education		0.087		
No formal education (reference category)			1.000	
Primary	0.522	0.258	0.554	(0.199,1.540)
Post-Primary	0.508	0.033*	0.339	(0.125,0.916)
Location				
Rural			1.000	
Urban	0.287	0.000*	0.157	(0.089,0.275)
Constant	1.536	0.001*	0.007	

Source: *2019 Survey*   **Significant factors at a = 0.05*

Examining socio-demographic characteristics of respondents on "*ever heard of HIV/AIDS*" (*table 2a)*, the results indicated that students' *age* and *class* are significant factors on the knowledge of HIV/AIDS existence with older students indicating more knowledge. Students' *gender, religion* and *parents' level of education* are not significant factors for students' knowledge existence of HIV/AIDS

The output of binary logistic regression of responses on "*ever heard of HIV/AIDS*" and the examined socio-demographic factors (*table 2b*) revealed that students' *gender* is not a significant factor although female students have lower odds than male. However, the table reveals that *age* and *class* are both significant factors with those in *SS3* with significant highest odds. *Religion* is not a significant factor, although *Islam* has the highest odds and the traditional believers have the least. *Educational level of parents* of respondents are not significant although those with *formal education* has higher odds of hearing about HIV/AIDS. *Location* of respondent is not a significant factor although students in *rural* setup have higher odds.

Table 2a: Socio-demographic details of respondents and "***ever Heard of HIV/AIDS***"

Characteristics		Ever Heard of HIV/AIDS		Chi-Square P-value (a=0.05)
		No n=364(72.8%)	Yes n=136(27.2%)	
Age	**Total (%)**			
10	2(0.4%)	1(50.0%)	1(50.0%)	
11	23(4.6%)	0(0.0%)	23(100.0%)	
12	54(10.8%)	3(5.6%)	51(94.4%)	
13	60(12.0%)	7(11.7%)	53(88.3%)	
14	79(15.8%)	13(16.5%)	66(83.5%)	
15	83(16.6%)	9(10.8%)	74(89.2%)	*0.002**
16	77(15.4%)	4(5.2%)	73(94.8%)	
17	65(13.0%)	2(3.1%)	63(96.9%)	
18	38(7.6%)	8(21.1%)	30(78.9%)	
19	12(2.4%)	4(33.3%)	8(66.7%)	
20	6(1.2%)	0(0.0%)	6(100.0%)	
23	1(0.2%)	0(0.0%)	1(100.0%)	
Gender	**Total (%)**			
Male	244(48.8%)	24(9.8%)	220(90.2%)	0.793
Female	256(51.2%)	27(10.5%)	229(89.5%)	
Class	**Total (%)**			
JS1	80(16.0%)	6(7.5%)	74(92.5%)	
JS2	80(16.0%)	11(13.8%)	69(86.3%)	
JS3	80(16.0%)	11(13.8%)	69(86.3%)	*0.005**
SS1	80(16.0%)	8(10.0%)	72(90.0%)	
SS2	80(16.0%)	14(17.5%)	66(82.5%)	
SS3	100(20.0%)	1(1.0%)	99(99.0%)	
Religion	**Total (%)**			
Christianity	392(78.4%)	41(10.5%)	351(89.5%)	0.380
Islam	99(19.8%)	8(8.1%)	91(91.9%)	
Traditional	9(1.8%)	2(22.2%)	7(77.8%)	
Mother's level of education	**Total (%)**			
No formal education	36(7.2%)	9(25.0%)	27(75.0%)	
Primary	100(20.0%)	9(9.0%)	91(91.0%)	*0.010**
Post-Primary	364(72.8%)	33(9.1%)	331(90.9%)	
Father's level of education	**Total (%)**			0.168
	38(7.6%)	7(18.4%)	31(81.6%)	

No formal education	76(15.2%)	9(11.8%)	67(88.2%)	
Primary	386(77.8%)	35(9.1%)	351(90.9%)	
Post-Primary				
Location	**Total (%)**			
Rural	250(50.0%)	18(7.2%)	232(92.8%)	*0.027**
Urban	250(50.0%)	33(13.2%)	217(86.8%)	

Source: *2019 Survey*   **Significant factors at a = 0.05*

Table 2b: Logistic regression of "***ever heard of HIV/AIDS***" on sociodemographic factors

Factor	Std Err.	P-value	OR	95% C.I. for OR
Age	0.122	0.039*	0.778	(0.612,0.988)
Gender				
Male (reference category)			1.000	
Female	0.333	0.331	0.724	(0.377,1.389)
Class		0.020*		
JS1 (reference category)			1.000	
JS2	0.574	0.416	0.627	(0.204,1.932)
JS3	0.585	0.722	0.812	(0.258,2.556)
SS1	0.706	0.334	1.976	(0.496,7.881)
SS2	0.698	0.873	1.118	(0.285,4.388)
SS3	1.252	0.005*	32.844	(2.822,382.193)
Religion		0.149		
Christianity (reference category)			1.000	
Islam	0.454	0.501	1.358	(0.557,3.308)
Traditional	0.993	0.082	0.178	(0.025,1.244)
Mother's level of education		0.201		
No formal education (reference category)			1.000	
Primary	0.673	0.078	3.277	(0.879,12.262)
Post-Primary	0.676	0.148	2.659	(0.707,10.005)
Father's level of education		0.866		
No formal education (reference category)			1.000	
Primary	0.729	0.597	1.471	(0.352,6.146)
Post-Primary	0.734	0.651	1.394	(0.331,5.872)
Location				
Rural			1.000	
Urban	0.361	0.171	0.610	(0.301,1.239)
Constant	1.713	0.005*	124.931	

Source: *2019 Survey*   **Significant factors at a = 0.05*

It is observed from *table 3a* that all socio-demographic details of respondents are significant for students' status of HIV/AIDS screening. More male students have done screening compared to female

Table 3b shows that *age, gender, class, father's level of education* and *location* are significant factors for secondary school students for ever done HIV/AIDS screening test. Female students have significant lower odds compared to male students. Students in *SS3, JS2,* and *JS3* have significant odds of getting screened while those in *SS1* and *SS2* have non-significant lower odds compared to students in *JS1*. Students whose fathers have Post-Primary education have

significantly lower odds compared to those with fathers that have no formal education. Students from urban schools are also found to have significantly lower odds of ever done HIV/AIDS screening test compared to those whose are from rural areas.

Religion and *mother's level of education* are non-significant factors. Although students that practice traditional religion have highest odds of getting screened and those whose mothers have Post-Primary education have lower odds.

Table 3a: Socio-demographic details of respondents & "***ever done HIV/AIDS screening test***"

Characteristics		Ever done HIV screening?		Chi-Square P-value (a=0.05)
		No n=364(72.8%)	Yes n=136(27.2%)	
Age	**Total (%)**			
10	2(0.4%)	2(100.0%)	0(0.0%)	
11	23(4.6%)	23(100.0%)	0(0.0%)	
12	54(10.8%)	45(83.3%)	9(16.7%)	
13	60(12.0%)	51(85.0%)	9(15.0%)	
14	79(15.8%)	61(77.2%)	18(22.8%)	
15	83(16.6%)	71(85.5%)	12(14.5%)	0.000*
16	77(15.4%)	63(81.8%)	14(18.2%)	
17	65(13.0%)	40(61.5%)	25(38.5%)	
18	38(7.6%)	30(78.9%)	8(21.1%)	
19	12(2.4%)	7(58.3%)	5(41.7%)	
20	6(1.2%)	1(16.7%)	5(83.3%)	
23	1(0.2%)	0(0.0%)	1(100.0%)	
Gender	**Total (%)**			
Male	244(48.8%)	179(73.4%)	65(26.6%)	0.004*
Female	256(51.2%)	215(84.0%)	41(16.0%)	
Class	**Total (%)**			
JS1	80(16.0%)	79(98.8%)	1(1.3%)	
JS2	80(16.0%)	61(76.3%)	19(23.8%)	
JS3	80(16.0%)	60(75.0%)	20(25.0%)	0.000*
SS1	80(16.0%)	67(83.8%)	13(16.3%)	
SS2	80(16.0%)	77(96.3%)	3(3.8%)	
SS3	100(20.0%)	50(50.0%)	50(50.0%)	
Religion	**Total (%)**			
Christianity	392(78.4%)	322(82.1%)	70(17.9%)	
Islam	99(19.8%)	69(69.7%)	30(30.3%)	0.000*
Traditional	9(1.8%)	3(33.3%)	6(66.7%)	
Mother's level of education	**Total (%)**			
	36(7.2%)	20(55.6%)	16(44.4%)	
No formal education	100(20.0%)	65(65.0%)	35(35.0%)	0.000
Primary	364(72.8%)	309(84.9%)	55(15.1%)	
Post-Primary				
Father's level of education	**Total (%)**			
	38(7.6%)	20(52.6%)	18(47.4%)	
No formal education	76(15.2%)	52(68.4%)	24(31.6%)	0.001*
Primary	386(77.8%)	322(83.4%)	64(16.6%)	
Post-Primary				
Location	**Total (%)**			
Rural	250(50.0%)	180(72.0%)	70(28.0%)	0.000*
Urban	250(50.0%)	214(85.6%)	36(14.4%)	

Source: 2019 Survey   *Significant factors at α = 0.05

Table 3b: Logistic regression of "***ever done HIV/AIDS screening test***" on sociodemographic factors

Factor	Std Err.	P-value	OR	95% C.I. for OR
Age	0.115	0.004*	1.389	(1.109,1.741)
Gender				
Male (reference category)			1.000	
Female	0.281	0.048*	0.573	(0.331,0.994)
Class		0.000*		
JS1 (reference category)			1.000	
JS2	1.064	0.020*	11.912	(1.479,95.953)
JS3	1.064	0.010*	15.63	(1.941,125.847)
SS1	1.137	0.319	3.107	(0.335,28.863)
SS2	1.248	0.956	0.933	(0.081,10.770)
SS3	1.141	0.008*	21.077	(2.250,197.390)
Religion		0.445		
Christianity (reference category)			1.000	
Islam	0.321	0.789	1.090	(0.581,2.046)
Traditional	0.808	0.203	2.796	(0.573,13.631)
Mother's level of education		0.275		
No formal education (reference category)			1.000	
Primary	0.518	0.921	1.053	(0.381,2.908)
Post-Primary	0.543	0.351	0.602	(0.208,1.747)
Father's level of education		0.016*		
No formal education (reference category)			1.000	
Primary	0.527	0.934	0.958	(0.341,2.690)
Post-Primary	0.529	0.037*	0.333	(0.118,0.938)
Location				
Rural			1.000	
Urban	0.319	0.000*	0.230	(0.123,0.430)
Constant	1.833	0.000*	0.002	

Source: *2019 Survey*   **Significant factors at a = 0.05*

Table 4: Knowledge about HIV/AIDS

S/N	Factor	Frequency Yes (%)	No (%)
1	Have you ever heard of HIV/AIDS?	51(10.2)	449(89.8)
2	Have you ever done an HIV/AIDS screening test?	106(21.2)	394(78.8)
3	Do you know your HIV/AIDS status?	136(27.2)	364(72.8)
4	HIV/AIDS poses a major threat to people's health?	379(75.8)	121(24.2)
5	Healthy-looking person can have HIV/AIDS?	296(59.2)	204(40.8)
6	HIV can be transmitted through sexual intercourse with an infected person?	453(90.6)	47(9.4)
7	Can a person get HIV infection *through kissing*?	191(38.2)	309(61.8)
8	HIV can be transmitted *from mother to child* if the mother is infected?	418(83.6)	82(16.4)

9	HIV can be transmitted *during pregnancy* if the mother is infected?	415(83.0)	85(17.0)
10	HIV can be transmitted *during breastfeeding* if the mother is infected?	433(86.6)	67(13.4)
11	HIV can be transmitted *during delivery* if the mother is infected?	344(68.8)	156(31.2)
12	HIV can be transmitted *by shaking hands* with an infected person?	164(32.8)	336(67.2)
13	HIV can be transmitted *by sharing cutleries/utensils* with an infected person?	324(64.8)	176(35.2)
14	HIV can be transmitted *by receiving blood* from an infected person?	432(86.4)	68(13.6)
15	Can HIV be transmitted *by sharing needles/syringe/blade* with an infected person?	429(85.8)	71(14.2)
16	Can HIV be transmitted *through coughing/sneezing* by an infected person?	280(56.0)	220(44.0)
17	Does *using condom* reduce the risk of having HIV?	357(71.4)	143(28.6)
18	Is HIV/AIDS curable?	195(39.0)	305(61.0)
19	Can a person contact HIV from *mosquito bite*?	215(43.0)	285(57.0)

Source: *2019 Survey*

4.   CONCLUSIONS

Without relevant and correct knowledge on HIV/AIDS, all efforts aimed at turning the tide of ever increasing prevalence rate especially among the youths will prove abortive [12]. This research examined some socio-demographical variables and knowledge about HIV/AIDs among secondary schools in a rural and an urban centres. Using chi-square and binary logistic, the results showed that HIV/AIDS status knowledge is significant for all socio-demographic factors considered expect religion and mother's level of education. *Male* students have higher but insignificant odds for knowing HIV/AIDS status when they are compared to female students while students in *SS3* have highest odds of knowing their HIV/AIDS status. Students living in rural centres have significantly higher odds of knowing their HIV/AIDS status compared to those in urban areas. Efforts should therefore be made at sensitizing students in early ages and early classes on the challenges posed by HIV/AIDS. Religious houses should also be encouraged to focus on campaigns aimed at ameliorating the status quo.

On assessment of hearing about HIV/AIDS among the students, location of students (urban or rural) is found to be a significant factor with those in urban areas having more knowledge. Mather's level of education is another factor that is found to be significant with students whose parents have post-primary education having the highest knowledge percentage. As with the HIV/AIDS status knowledge, SS3 students are found to have odds that is in multiples of all other classes on the knowledge of existence of the disease. This implies that if effort is made on those in other classes, knowledge rate would also be on the increasing side.

Highest percentage for those that had done HIV/AIDS screening was found among older students and those in SS3. More percentage is also noticed among traditionalist compared to other two main religions. Male students are as well found to have more likelihood of getting screened when compared to their female counterparts. Result also showed that students living in rural areas are about twice more likely to get screened for HIV/AIDS.

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Based on the results obtained, various bodies (governments and non-governmental) that support campaigns against HIV/AIDS are urged to focus more publicity on students in urban centres and also to ensure that more enlightenments are done for students at early stages and if possible introduce HIV/AIDS related curriculum into schools programmes.

CONFLICTS OF INTEREST
No conflict of interest was declared by the authors.

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