International Journal of Intellectual Discourse (IJID)
ISSN: 2636-4832 Volume 3, Issue 2. December, 2020

Specifying a measurement model for structural relationships between HIV/AIDS message exposure and HIV/AIDS knowledge, attitude, and practice

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Abstract
The interests of scholars on the relationships between HIV/AIDS message exposure and HIV knowledge, attitude and practice as the epidemic is no longer seen as only a health issue; its ramifications cover all aspects of society from economic, social structures to psychological makeup of communities. The study bases on the Advertising Research Foundation's (ARF) version of Hierarchy of Effects (HoE) model to HIV prevention communication postulates that exposure to information on HIV/AIDS directly leads to HIV/AIDS knowledge, favorable attitude and finally HIV/AIDS safe actions (behavior). But the study of media use and HIV/AIDS KAP leaves much to be explored methodologically according to Mattson (2008). Therefore, this study is an attempt to test a measurement model of HIV/AIDS message exposure and KAP based on the ARF's HoE theory. Results show that the measurement model is fit for the testing of a structural model.

Keywords: HIV/AIDS Message Exposure, HIV Knowledge; HIV Attitude; HIV Practice, Measurement Model

1.0 Introduction

The fast spread of the AIDS pandemic has engendered a vigorous debate about the role of media in fighting it. The reasons adduced, so far, are clear; that medical science has been unable to offer anything more than ways or methods of turning it from a deadly into a chronic condition, through the therapies of anti-retroviral. Because these medications are costly and complex, much emphasis and attention on HIV/AIDS had shifted to prevention. This simply translates into encouraging people to change their attitudes towards the syndrome, and behavior in that most intimate area, sex. Therefore, resources have been deployed into public information, everything from billboard campaigns to the transmission of messages about HIV/AIDS in TV programs:

> When you are working to combat a disastrous and growing emergency, you should use every tool at your disposal. HIV/AIDS is the worst epidemic humanity has ever faced. It has spread further, faster and with more catastrophic long–term effects than any other disease. Its impact has become a devastating obstacle to development. Broadcast media have tremendous reach and influence, particularly with young

> people, who represent the future and who are the key to any successful fight against HIV/AIDS. We must seek to engage these powerful media organizations as full partners in the fight to halt HIV/AIDS through awareness, prevention and education(Kofi Annan, former UN Secretary General as cited in UNAIDS, 2004, p. 4)

Substantiating the same position as far back as the 80s, Hirose, Nakaune, Ishizuka, Tsuchida, and Takanashi, (1998) depicted a correlation between media reportage of HIV/AIDS and public risk perception of the epidemic and safer behavior. As time goes by, the complexity of the challenge raised by AIDS has become much more visible. The epidemic is no longer seen as only a health issue; its ramifications cover all aspects of society from economic, social structures to psychological makeup of communities. The pandemic has come to be recognized as a serious development issue for countries since HIV/AIDS and poverty feed off each other.

Combating HIV/AIDS is the number sixth item on the list of Millennium Development Goals, which signals its relative importance in the global scheme of things. Studies have passed the stage of conjecture about the epidemic at the turn of this new millennium (Ugande, 2007). AIDS poses a serious challenge, which can really devastate whole regions and crack decades of national development.

While there exist many models of investigating community health issues, the cognitive, affective and behavioral approach (KAP model) seemed more attractive to researchers because of its ability to reveal plausible pathways to addressing health concerns especially by identifying misconceptions about diseases and affective barriers or obstacles to prevention or protection. Buttressing this point, Bhattacharyya (1997) and Stone and Campbell (1984) (cited in Launiala, 2009) stated that the hallmark of KAP survey model lies in its characteristic of apt presentation of results, generalizability of results from small sample to wider population, ease of design, administration and results interpretation. Even though it is very dangerous to assume linear progression from knowledge to favorable attitude and ultimately to safe practice, the KAP model presumes that decisions on behavior change has cognitive and psychological dimensions.

Majority of the authors referenced thus far further underscored the importance of the link between people's knowledge and their attitude, which will subsequently influence behavior. Accordingly, those things which are central to HIV/AIDS study form part of the current strategies to curtail the effect of the epidemic. Mainly KAB/P studies attempt to capture the highlights of the multi-dimensional nature of decision making in behavior. Therefore, the inclusion of these variables in research into safer HIV/AIDS practices forms the integral part of the fight against the epidemic. Previous strategies to knowledge, attitude and behavior studies have their focus and analysis centered on either purely descriptive statistics or classical test theory approach by the use of sum scores (e.g. Zhou, Sun &Mantell,2007). But according to Bouanchaud (2011) the summed composite scores render easy calculations, hence more statistically powerful approach is needed to be used citing that the disadvantages of classical test theory approach included the assumption that all of the questionnaire items concerning knowledge, attitude and behavior on HIV/AIDS have equal weight.

Against this backdrop the present study jettisoned the summed scores approach by considering the HIV/AIDS message exposure and the KAP variables as reflective latent constructs in a structural model.

Earlier studies like Li et al. (2009) observed a symbiotic relationship between the two major communication channel types, mass media and interpersonal channels, in fighting HIV/AIDS. The authors observed that increase in media message exposure has the likelihood of increasing interpersonal channel communications and message exposure about HIV/AIDS. A comprehensive study that models the effect of HIV/AIDS message exposure would provide an insight, thereby giving a clue to stakeholders as to how to effectively utilize the channels for optimal effectiveness. In addition, HIV/AIDS messages are adjudged as potent tool for HIV/AIDS awareness and increasing protective and preventive behavior; but 'message exposure on HIV/AIDS' as a major independent variable interacting with other KAP variables appears to be conspicuously missing in all HIV/AIDS KAP studies in West Africa, which is a potent conceptual and methodological gap. Li, et al. (2009) and Bekalu and Eggrmont (2013) and similar other studies e.g. Moore (2008); Letamo (2011) and Aung, et al. (2013) suggested there seems to be a correlation among the HIV/AIDS KAP variables and that respondents' major sources of information are the mass media. However, there appears to be no study that went ahead of the direct effects, to predicting specific roles like that of possible mediation of HIV/AIDS knowledge and safe attitude between HIV/AIDS message exposure and HIV/AIDS safe practice. Separating different roles for the constructs of HIV/AIDS KAP and message exposure in a mediation model could give a further clarification to the subject.

Bouanchaud (2011) criticized the analysis of media exposure and KAP on HIV/AIDS using classical theory of sum score and recommended dealing with the constructs as reflective latent constructs, yet to date this researcher is aware of no study that attempted such methodological possibilities especially in Africa.

After reviewing a number of articles to decipher the effects of general media and message exposure on behavior, Annenberg Media Exposure Research Group (2008) reported that studies revealed mixed results, some of the studies finding substantial evidence for the effect of general media exposure, some of them finding moderate effect while others find no effect. The report pointed out that studies have become more methodologically sophisticated recently; instead of investigating the effects of general media exposure or exposure to particular media genre, researchers now began to use specific exposure measures, for example 'exposure to sexual content'. The report stated, "The use of these specific sex content exposure measures, in comparison to general or genre exposure measures, have increased the likelihood of finding a significant association between exposure and behavioral outcomes." (p. 1).

Literature Review

Hannan (2009) adopted the Advertising Research Foundation's version of the Hierarchy of Effects model to HIV prevention communication, revealing that exposure to information on HIV/AIDS automatically leads to HIV/AIDS knowledge, favorable attitude and finally HIV/AIDS safe actions (behavior) But the study of media use and HIV/AIDS knowledge in northwestern Ethiopia by Bekalu and Eggrmont(2013) in that respect,

delivered mixed results. Exploring the knowledge gap resulting from mass media use differentials in the study sample, testing the relationship between mass communication channel exposure on HIV/AIDS and HIV/AIDS knowledge, the study detected that in the total of respondents, message exposure is not a significant predictor of knowledge on HIV/AIDS. However, at the same time, the research showed that the knowledge gap between the sample with high education and those with low education was inversely proportional to the hike in media use on HIV/AIDS. This means that the knowledge gap between the two groups reduces along with the increase in HIV/AIDS message consumption.

While in a different study earlier by in China however, results indicated that HIV/AIDS related message exposure directly linked with HIV/AIDS favorable attitudes and safe behavior, especially stigmatizing attitude towards people living with HIV/AIDS. The study however states thus, "although there have been theoretical debates on how and why mass media communications influence behavior, there is considerable empirical evidence showing that the mass media can be used for attitude and behavioral changes associated with HIV/AIDS" (Li et al. 2009, p. 1).

According to Bouanchaud (2011), HIV/AIDS intervention strategy had their direction of effort making sure that people at risk, and even those who are not at risk have the basic "tools" at their disposal, so that they can make requisite judgment about HIV/AIDS safer or risk practices regarding sexual behavior. This involves the possession of sound knowledge on HIV/AIDS, which is a requirement for the adaption of behaviors that actually reduced the risk of HIV transmission. Consequently, it becomes important to measure a population's knowledge of HIV/AIDS, which will result in understanding the extent to which the population can avoid the epidemic.

Notwithstanding, in a related study in Ghana on young women, Asamoah, Asamoah and Agardh (2017), detected that adolescent women with more HIV/AIDS knowledge and frequent mass media message exposure happened to be less likely to show stigmatizing attitude to PLWH, or act as agents of stigma. While Nubed and Akoachere (2016) also found HIV/AIDS knowledge and attitude among secondary school students in Cameroon are related. Conversely, the study by Gemeda, Gandile and Bikamo (2017) revealed that HIV/AIDS knowledge and attitude do not significantly predict HIV/AIDS behavior among Ethiopian students, which is rather a bizarre finding in the quantum of literature on the subject.The study attempted to adopt a modern method of multivariate analysis (CB SEM) suggested that the theoretically assumed links between HIV/AIDS KAP variables is not truly there. In the study, Gemeda, Gandile and Bikamo (2017), using Confirmatory Factor Analysis of the covariance-based Structural Equation Modeling (CB-SEM), results showed that both HIV/AIDS attitude and knowledgedo not significantly predict HIV/AIDS behavior. This differential in finding possibly stemmed from a gross mistakeby the authors in using HIV/AIDS attitude and HIV/AIDS knowledge scale that these researchers consider a problematic scale measure of the independent latent variables. The study used a 5-point self-report scale 1= Don't know at all, to 5= know very well, as responses to items on HIV/AIDS knowledge. This is considered not valid because a respondent might tick 'Know very

well' to a question on HIV/AIDS but in the actual sense, he/she just felt he/she knows while they know not, and vice versa. The response scale cannot in reality measure the extent of HIV/AIDS knowledge. The correct scale points, as adopted by myriads and other studies (e.g. Thomson,Currie, Todd,& Elton, 2009) are the False or True scale or the Completely false to Completely True scale, where a respondent chooses either a statement is true or it is false, and the points between Completely False and Completely True represent the degree of certainty the respondent has in his/her knowledge. This problematic nature of the HIV/AIDS attitude and knowledge measures in the study might have led to the flawed finding.

Majority of the authors referenced thus far further underscored the importance of the link between people's knowledge and their attitude, which will subsequently influence behavior. Accordingly, those things which are central to HIV/AIDS study form part of the current strategies to curtail the effect of the epidemic. Mainly KAB/P studies attempt to capture the highlights of the multi-dimensional nature of decision making in behavior. Therefore, the inclusion of these variables in research into safer HIV/AIDS practices forms the integral part of the fight against the epidemic. Previous strategies to knowledge, attitude and behavior studies have their focus and analysis centered on either purely descriptive statistics or classical test theory approach by the use of sum scores (e.g. Zhou, Sun &Mantell,2007). But according to Bouanchaud (2011) the summed composite scores render easy calculations, hence more statistically powerful approach is needed to be used citing that the disadvantages of classical test theory approach included the assumption that all of the questionnaire items concerning knowledge, attitude and behavior on HIV/AIDS have equal weight. Against this backdrop the present study jettisoned the summed scores approach by considering the HIV/AIDSmessage exposure and the KAP variables as reflective latent constructs in a structural model, in response to the need for statistically robust approach to studying structural relationships between HIV/AIDS message exposure and KAP.

Objectives

This article set out to:

a) render descriptive statistics for the HIV/AIDS message exposure and KAP constructs;
b) conduct a factor analysis of the Constructs;
c) specify a measurement model for the relationships between HIV/AIDS message exposure and KAP.

Theoretical Framework

The Advertising Research Foundation (ARF) developed a variant of the Hierarchy of Effects communication model, which delineates the functions of exposure to messages,knowledge, attitudes and action (translated as behavior or practice) concerning an idea, service or product (Barry, 1987: 254).In addition, the model is also relevant to HIV/AIDS prevention or 'public health mass communication' as it provides a basic framework by focusing on systematic persuasion strategies keeping in mind the components of knowledge, attitude and behavior for creating awareness for behavior change (Baran& Davis, 2003).Though having origin in advertising and marketing communication, Hanan (2009 p. 134) discussed the Advertising Research Foundation's Hierarchy of Effects model as having relevance and application in HIV/AIDS prevention communication and by extension, research.

This model views individual behavior change in a linear sequence which commences with exposure to information (through communication media) and assumes that knowledge, favorable attitudes and ultimately action in form of trial and adoption of the desired behavior or practice will follow. The model as adopted and applied to HIV/AIDS communication by Hanan (ibid), who advocates for evaluating consequences of exposure to messages concerning HIV/AIDS on people's knowledge, attitude and action (behavior) regarding HIV/AIDS through surveys. Feedback from that research is used to decide when to transmit message designed to produce other effects such as decision-making or action. Particularly, within the Advertising Research Foundation's version of Hierarchy of Effects model as applied to health communication of HIV/AIDS, adopted by Hanan (2009), this study seeks to explore and to clarify further the relationships of exposure to HIV/AIDS information from the media with HIV/AIDS knowledge and favorable attitudes on HIV/AIDS safe behavior among the respondents of the study.

Methodology

This study was conducted on *Islamiyah* schools in Bauchi state, Northern Nigeria, because the system incorporates both students who are attending formal secular schools and those who are not. The population of this study consists Classes 4, 5 and 6, which contained adolescent girls in the *Islamiyah* schools across the 8 zones selected in the study area, which has the estimated population of about 8,756 as at *Maulud 1436 A.H.* (2015 A.D.) festivals. Junior classes are populated mostly by girls who are not up to 11 years, so they are not part of this study. population of the affected classes in the 10 schools selected for this study was estimated at 8,726 as supplied by the *Riyala* (Islamiyya schools coordinating body). Though Hair et al. (2006) suggested a sample size of 200 for maximum likelihood estimation in Structural Equation Modelling, the present study, in order to increase confidence in what the study set out to predict, goes ahead to use certain valuable parameters according to Cochran's (1977:72-76) formula:

Formula: Cochran (1977:72-76):

$$n = \frac{n_0}{1 + (n_0/N)}, \text{ where } n_0 = t^2 pq / d^2$$

And $t^2 = 2^2 = 4,\ p = 0.8 \text{ and } q = 0.2$

$d^2 = (1/25)^2$ (a chance of 1 unlucky sample in every 25 selected candidates)

This implies our sample size 'n' is obtained as follows

From equation (1) $n_0 = 4(0.8)(0.2)/0.0016 = 0.64/0.0016 = 400$

Therefore, our sample size is: $n = \frac{n_0}{1 + \left(n_0/N\right)} = \frac{400}{1 + \left(400/8756\right)} = \frac{400}{1 + 0.04568296} = \frac{400}{1.045668296} = 383$

Consequently, to further mitigate the possibility of low response rate from sampled respondents, the sample of 500 was considered by upping the 383 sample by about 40% as suggested by Salkind (1997). The study used multi-stage probability random technique (the *Islamiyya* school, then the classes, then the subjects).

The Measures

The questionnaire survey consisted of five sections. Section 'A' made of 16 items sought the profile of the respondents, mainly adapted from World Health Organization's Health Behavior among School Children (HBSC) questionnaire on HIV/AIDS among young persons. After reviewing a number of articles to decipher the effects of general media and message exposure on behavior, Annenberg Media Exposure Research Group (2008) reported that studies revealed mixed results, some finding substantial evidence for the effect of general media exposure, some finding moderate effect while others find no effect. The report pointed out that studies have become more methodologically sophisticated recently; instead of investigating the effects of general media exposure or exposure to particular media genre, researchers now began to use specific exposure measures, for example 'exposure to sexual content'. The report stated, "The use of these specific sex content exposure measures, in comparison to general or genre exposure measures, have increased the likelihood of finding a significant association between exposure and behavioral outcomes." (Annenberg Media Exposure Research Group, 2008, p. 1).

Sequel to the above conclusion, the model tested in this study considers the specific measure of "HIV/AIDS message exposure". Therefore, Section 'B' was a scale on HIV/AIDS message exposure adapted from Li et al. (2009).

Section 'C', the scale of HIV/AIDS knowledge was adapted from a cross-national WHO instrument on HBSC which sought information on knowledge on HIV/AIDS causes, symptoms, modes of transmission, prevention and epidemiology made of 29 items (Thomson et al., 1999). The response scale of which was a 5-point Completely False – Completely True scale, adapted from Rhodes and Wolitslci (1989) as cited by Aiken (2002). Section 'D' on HIV/AIDS favorable attitude and attitude to those living with the syndrome (Thomson et al., 1999), consisted of 12 questions, responses to which was also adapted from Rhodes and Wolitslci (ibid).

Section 'E' elicited information on respondents' safe behavior or practice on HIV/AIDS and intention to practice, consisting of 17 items developed for the purpose of this study. Five-point response scale was used in sections 'B' to 'F' for the reasons forwarded by Johns (2010), that practice of social science research gives distorted results if scale points fall below 5 or above 7. He submitted that test "confirms that data from Likert items (and those with similar rating scales) become significantly less accurate when the number of scale points drops below five or above seven"(Johns (2010, p. 1).

Reliability of the Survey Instrument

Sections A to D of the study questionnaire were adapted from established UN KAP-B and WHO's HBSC on HIV/AIDS instrument as adapted in Thomson, et al. (1999) etc. In a similar study Shokoohi et al. (2016) reported the internal consistency reliability Cronbach alpha coefficient .751 for HIV/AIDS knowledge and .867 for attitudes towards HIV/AIDS in a study of young persons in Iran. While Lee, Hornik and Hennesy (2008) reported Cronbach alpha reliability estimate for exposure to

different legacy mass media, ranging from .54 to .66.

Results

Response Rate

From the500 sample, 487 respondents turned up for the study. The remaining 13 students who did not turn up were considered as non-response, giving rise to 97.4% response rate. Based on Jobber's (1989) definition of response rate therefore, a response rate of 97.4% is considered as highly adequate for analysis because according to Sekaran (2003), even a 30% response rate was considered adequate for surveys; (this study achieved about 300% of that benchmark as shown in Table 1.

Table 1: Response rate

Response	Rate
Questionnaires distributed	500
Questionnaires Returned	487
Questionnaires not returned	13
Invalid questionnaires	0
Usable questionnaires	487
Response rate	97.4%
Valid response rate	97.4%

Respondents HIV/AIDS Message Exposure

A significantly high proportion of the respondents (41%) remarkably indicated that mass media were their major sources of HIV/AIDS message, as indicated in Table 4.3 below, followed by secular school teachers (17.2%), then *Islamiyya* school teachers (11.3%). This finding matches the finding of Brodie et al. (2004) which concluded that in America, mass media are considered as major channels of HIV/AIDS message exposure to the public. Interestingly, matching the pattern of finding in developed countries, this finding shows that next to mass media, teachers were the major sources of HIV/AIDS message exposure for the adolescent girls (secular school teachers, 17.2% and *Islamiyya* school teachers, 11.3%). This finding further indicates that in the *Islamiyya* school system, teachers were concerned about HIV/AIDS, thereby discussing the epidemic with the girls. At the same time, this finding suggested that the *Islamiyya* system, which pervades the north-eastern Nigeria and some other parts of the Northern Nigeria, could be used as a conduit for passing information of safety and protection on HIV/AIDS. More study on this regard is required.

Table 2: Respondents' main sources HIV/AIDS message exposure (N=476)

Category	Frequency	(%)
Mass media	195	41
Secular school teachers	82	17
Islamiyya teachers	54	11
Friends	52	11
Parents	36	8
Relatives	26	6
Other	3	1

The finding in the present study corresponds with that of Li et al. (2009) that majority of their Chinese participants indicated mass media as their major sources of HIV/AIDS message. HIV/AIDS message campaign delivery channels according to Li et al.(ibid) have their different domains of effectiveness. The authors suggested that HIV/AIDS message exposure through a mass media channel has more effectiveness than interpersonal channel in the areas of awareness, transmission knowledge and behavior change. Sometimes particularly on the issue of stigmatization, interpersonal channels like friends and the school are more effective.

Respondents' Media Consumption

Although, Table 2 above shows mass media are the main sources of information on HIV/AID, it did not show the extent of exposure. Table 3 summarizes the estimated

media exposure in minutes per day for the different mass media. For radio and TV, the majority of the respondents had estimated daily exposure less than 1 hour (60% and 42% respectively). Respondents longest estimated exposure per day was recorded on Hausa Home video, 1-3 hours 29% and more than 3 hours 24%. Put together, 53% of the respondents had more than 1 hour estimated daily exposure to Hausa Home Video. This matches Larkin's (2006) conclusion on the recent popularity of Hausa Home Video and *Nollywood* generally.

The finding here is a radical departure from Bankole's (2004), which showed majority of adolescents had no weekly exposure to any media. Majority of the respondents have exposures to Hausa novels, English novels and textbooks from 1 minute to 1 hour with textbooks having majority of that percentage skewed close to 1 hour. Similarly, the largest distribution of the respondents 63% spend from 1 minute to 1 hour daily, their free time attending to mass media. The respondents reported estimated daily media consumption shows majority (34%) having appreciable exposure to different media more than 3 hours. As for English newspaper, Hausa newspaper, news magazines, women magazine and health magazines, the respondents had insignificant exposure(from 66 to 80 percent of them having no daily exposure.

Table 3: Percentage (%) distribution of respondents based on estimated amount of media exposure per days

Mass medium	0 min	1-30 mins	31-59 mins	1-3 hrs	>3 hrs
Listen to Radio	17.6	55.9	16.8	7.6	2.1
Watch TV	27.3	42.4	20	7.1	3.2
Watch DVD Hausa Film	8	18.7	19.5	29.4	24.4
Watch Satellite TV	33.6	23.3	16.2	15.8	11.1
Read English Newspaper	80	12.2	5.5	1.5	0.8
Read Hausa Newspaper	52.7	31.9	9	4	2.3
Read News Magazine	77.3	14.5	6.7	0.8	0.6
Read Women Magazine	74.6	14.7	6.7	2.3	1.7
Read Health Magazine	66	21	6.9	4.6	1.5
Read Hausa Novel	24.6	31.7	18.1	12.4	13.2
Read Eng. Novel	48.5	26.9	11.6	9.5	3.6
Read Eng. Text Books	12	27.5	30.7	16.2	13.7
Free Time for Media	22.9	38.9	24.4	10.9	2.9
Media Consumption Per Day	8.2	16	19.1	22.5	34.2

Descriptive Analysis of Latent Constructs

I. HIV/AIDS Message Exposure Levels

The purpose of this section is to present results of descriptive analysis for the reflective latent constructs. For HIV/AIDS message exposure and HIV/AIDS knowledge constructs, a description of the distribution of the respondents was provided in three levels: High, Moderate and Low for HIV/AIDSmessage exposure, and Good, Moderate and Poor for HIV/AIDS knowledge as categorized in related literature such as Naugle and Hornik (2014) andNubed and Akoachere (2016).

The construct of message exposure on HIV/AIDSwas computed to obtain overall composite score for each respondent. The maximum score was 70 and respondents scores were converted to percentage and

based on that the total scores were categorized into three levels to show the distribution of the respondents based on their levels ofmessage exposure on HIV/AIDS, as seen in Table 4. The result shows that majority of the respondents 72% have moderate HIV/AIDS message exposure i.e. those scoring between 23.31 and 46.62. This outcome shows that in terms of message exposure on HIV, the respondents have a somewhat moderate exposure, and there is a marginal difference (2%) between the percentages of those with high HIV/AIDS exposure and those with low exposure.

Table 0: Respondents' levels of message exposure on HIV/AIDS

Level of HIV Message Exposure	Frequency	(%)
High Exposure	73	15
Moderate Exposure	342	72
Low Exposure	61	13
Total	476	100

On the same vein, Li et al. (2009) went on to assert that aside from the channel of delivery, the level of HIV/AIDS message exposure also counts. The study in Kenya by Agha (2003) showed a strong relationship between HIV/AIDS message exposure dose and behavioral response. This is a situation in which the intensity of message exposure cultivated desirable behavioral outcomes in safer sex and condom use efficacy.

II. Respondents' Knowledge Levels on HIV/AIDS

The respondents' knowledge on HIV/AIDS was measured in 29 questionnaire items with 145 as maximum scoring point. The composite scores whichreflect overall knowledge scorewere converted into percentage and categorized into three levels (Good, Fair and Poor). Respondents scoring ≥75% are categorized as having Good HIV/AIDS knowledge, 51-74%(73.95-107.3 composite scores) Moderate knowledge and ≤50% Poor knowledge (Nubed& Akoachere, 2016). At the same time here, the result as summarized in Table 5 shows that majority of the respondents had moderate knowledge of HIV/AIDS (75%). This result shows inclination of the respondents to having moderate level knowledge on HIV/AIDS.This finding is remarkable in terms of showing the respondents having appreciable level of HIV/AIDS knowledge, which can be directly attributed to media use because majority of them reported mass media as their major source of their HIV/AIDS information as seen earlier. This finding corresponds with the findings of Gańczak et al. (2009), Aung et al. (2013), Xiao et al. (2015) Mahtab (2019) and Rahnama (2009).

Table 5: Respondent' knowledge levels on HIV/AIDS

HIV/AIDS knowledge level	Frequency	(%)
Good Knowledge	69	14
Moderate Knowledge	357	75
Poor Knowledge	50	11
Total	476(100)	100

III. Respondents' Levels of Attitudes toward HIV/AIDS

In order to investigate the respondents' overall level of favorable attitude toward HIV/AIDS, the 'attitude' construct was computed to get a single score measuring the total 'attitude' towards HIV/AIDS for each respondent.The overall score computed was categorized into 2, Good&Poor attitude as shown in Table 6 below. Maximum score was 70; the mean score (50) was obtained. Any case below the mean score was considered as Poor Attitude and cases on the mean value and above were considered as Good Attitude (Nubed&Akoachere, 2016). The result shows that greater percentage

(58%) of the respondents had Good attitude. To HIV/AIDS. This result is consistent with Mahtab (2010) and Rahnama (2009) but inconsistent with Aung et al (2013).

Table 6: Respondent' attitude toward HIV/AIDS

HIV/AIDS Attitude Categories	Frequency	(%)
Good Attitude	276	58
Poor Attitude	200	42
Total	476	100

IV. Safe Practice on HIV/AIDS

Respondents' safe practice on HIV was measured and the overall score computed to obtain a single composite score for each respondent. The scores were categorized in to two classes:Safe Practice and Risky Practice. Maximum score was 85 and the mean score (51) was obtained. Any case below the mean score was considered as Risky Practice and cases on the mean value and above were considered as Safe Practice(Nubed&Akoachere, 2016).The results here as contained in Table 7 breaks into exactly two equal classes: 50% of the respondents with Safe Practice and 50% with Risky Practice. This result matches almost exactly with Aung (2009), where result breaks exactly to equal halves. The result is also consistent with Rahnama (2009).

Table 7: Respondent' safe practice on HIV/AIDS

Level of Practice	Frequency	(%)
Safe Practice	238 (50)	50
Risky Practice	238 (50)	50
Total	476	100

Factor Analysis

In the assessment of the measurement model, four factors emerged with three items for HIV attitude, 3 for HIV knowledge, 3 for HIV safe practice and 7 for message exposure, with loadings above .50.

Table 8: Factor analysis

Code	HIV Attitude	HIV Knowledge	HIV Practices	Safe HIV/AIDS exposure	Message
HIVAtt10	.682	.275	.230	.105	
HIVAtt5	.692	.252	.325	.050	
HIVAtt6	.805	.418	.299	.062	
HIVKn1	.365	.758	.353	.141	
HIVKn21	.159	.619	.211	.161	
HIVKn28	.383	.781	.269	.210	
HIVPrc11	.193	.260	.618	.034	
HIVPrc15	.396	.364	.870	.109	
HIVPrc4	.257	.248	.757	.066	
HIV Billboards	.097	.156	.087	.748	
HIVEng.Npp	.056	.200	.099	.727	
HIVHausaNpp	.082	.123	.056	.664	
HIVHealthMag	.079	.174	.043	.773	
HIVInfoRadio	.079	.210	.058	.718	
HIVInfoTV	.069	.135	.122	.682	
HIVNewsMag	.012	.159	.025	.741	

Measurement Model Assessment

Measurement model assessment includes establishing individual item reliability, convergent validity, discriminant validity and internal consistency reliability in a model under assessment. Figure 1 shows the estimates of the measurement model.

Individual Item Reliability

Following Hair et al. (2014) and Duarte and Raposo (2010), in assessing individual item reliability, the outer loadings of the different constructs' measures were examined. In order to retain any item, the general rule of thumb is its loading has to be between .40 and .70. Sixteen items made the threshold above 0.40 loadings from the survey items, the rest with loadings lower than the threshold were deleted. Best indicators were retained. Hayduk and Littvay (2012) posited that using few best indicators in structural equation modelling was better, "[o]ne or two indicators are often sufficient… scale created from multiple indicators can introduce additional problems and are prone to being less desirable" (p. 1). Bouanchaud (2011) suggested hence, that when only the best functioning items are retained, surveys are better able to measure the constructs of interest to the required accuracy levels. Against the foregoing therefore, the items retained in this survey's measurement model had loadings between 0.619 and 0.870 as shown in the figure 1below.

Internal Consistency Reliability

The common estimators of internal consistency reliability of an instrument are composite reliability coefficient and Cronbach's alpha (Bacon, Sauer & Young, 1995; Bijttebier et al, 2000; Peterson & Kim, 2013). Against this position and as a justification for using composite reliability coefficient, two major reasons are adduced: First, it renders a much less biased reliability estimate than Cronbach's Alpha coefficient. This is because Cronbach's alpha works with the assumption that all construct items contribute equally to the substance of the construct, without necessarily taking into consideration the exact contribution of individual loadings of the items (Tompson, Barclay & Higgins, 1995; Gotz, Liehr-Gobbers&Krafft, 2010). Second, the measure of Cronbach's alpha may underestimate or overestimate reliability scale. That indicators have different factor loadings was taken into account by composite reliability estimates. Other advantage of composite reliability measure of constructs is that it can be interpreted in similar way as Cronbach's alpha (i.e. it does not matter whichever reliability coefficient is used, the value of internal consistency reliability of .70 or above is considered adequate or satisfactory for a model). Values below .60 are regarded as lacking reliability.

Table 2: Internal consistency reliability

Code	Loading	AVE	Composite Reliability
HIV Attitude		**.530**	**.771**
HIVAtt10	.682		
HIVAtt5	.692		
HIVAtt6	.805		
HIV Knowledge		**.523**	**.765**
HIVKn1	.758		
HIVKn21	.619		
HIVKn28	.781		
HIV Safe Practices		**.570**	**.796**
HIVPrc11	.618		
HIVPrc15	.870		
HIVPrc4	.757		
HIV/AIDS Message exposure		**.522**	**.884**
HIVBillBoards	.748		
HIVEngNpp	.727		

Code	Loading	AVE	Composite Reliability
HIVHausaNpp	.664		
HIVHealthMag	.773		
HIVInfoRadio	.718		
HIVInfoTV	.682		
HIVNewsMag	.741		

The Table 9 above shows the factor loadings of each item retained their composite reliability and Average Variance Extracted of each construct. Using composite reliability coefficient for estimating reliability, the interpretation was based on rule of thumb suggested by Bagozzi and Yi (1988) and Hair et al. (2011) that coefficient of composite reliability should not be below the benchmark.70. Latent construct composite reliability coefficient for each latent construct as depicted in Table 9 ranged between .765 and .884; all above the minimum required level of .70, indicating acceptable or adequate internal consistency reliability of measures in the present study. This in a way means that all items in a construct are actually measuring the same construct.

Convergent Validity

Especially in social science research, determining the extent to which latent constructs are truly represented by items and correlate with other measures in the same latent construct is important (Hair et al., 2006). Fornell and Larcker (1981) suggested that the measure of convergent validity can be determined from Average Variance Extracted (AVE) for each latent construct, while Chin (1998) posited that, to achieve acceptable convergent validity, each construct's Average Variance Extracted must be .50 and above. Therefore, based on Chin (1998), the values of AVE as shown in Table 9 above are above .50 indicating adequate convergent validity. This means that there is correspondence among the constructs in this study, which are actually theoretically considered to be related to one another.

Discriminant Validity

Duarte and Raposo (2010) referred to discriminant validity as how much each latent construct is different from all other latent constructs. This study used Average Variance Extracted (AVE) to determine discriminant validity (Fornell&Larcker, 1981). Further, Chin's (1998) criterion for determining discriminant validity was applied by comparing the loadings of indicators with other reflective indicators shown in cross loadings table. As a rule of thumb, Fornell and Larcker (1981) recommended using AVE with benchmark of .50 or above in evaluating discriminant validity. For constructs to achieve sufficient discriminant validity, the square root of the Average Variance Extracted (AVE) must be more than the correlations among latent constructs (Fornell&Larcker, 1981). As shown in Table 10, the AVE values ranged from .522 to .570, which are acceptable values. The latent constructs' correlations are compared with the square roots of AVE values which are shown in bold face in Table10.The square roots of AVE across the constructs were greater than the correlations among the constructs, thereby achieving sufficient discriminant validity (Fornell&Larcker, 1981). This means the constructs can actually be discriminated from one another.

Table 3 Latent variable correlation

Latent Variable	1	2	3	4
1. HIV Favorable Attitude	**.728**			
2. HIV Knowledge	.443	**.723**		
3. HIV Safe Practices	.392	.393	**.755**	

4. HIV Message exposure	.096	.234	.099	**.723**

Note: Diagonal elements (figures in bold) are the square root of the Average Variance Extracted (AVE) shared between the constructs and their measures. Off diagonal elements are the correlations among constructs. Source: The Researcher

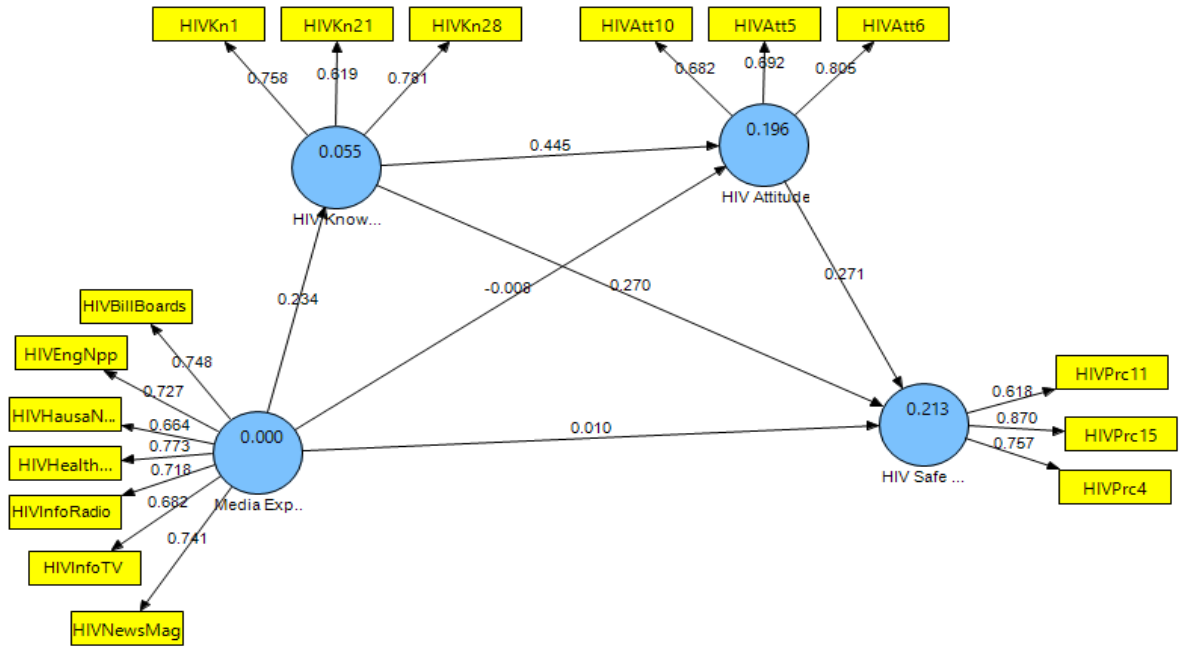

Figure 1 The measurement model

Conclusion

Given the observed values in the parameters plotted in this study for HIV/AIDS message exposure and KAP, the measurement model has successfully been specified. It is therefore concluded that the theoretical structural model is feasible and can be executed.

References

Agha, S. (2003). The impact of a mass media campaign on personal risk perception, perceived self-efficacy and on other behavioural predictors. AIDS care, 15(6), 749-762.

Aiken, L. (2002). Attitudes and related psychosocial constructs: Theories, assessment, and research. London: Sage.

Annenberg Media Exposure Research Group. (2008). Linking measures of media exposure to sexual cognitions and behaviors: A review. Communication methods and measures, 2(1-2), 23-42.

Asamoah, C. K., Asamoah, B. O., &Agardh, A. (2017). A generation at risk: A cross-sectional study on HIV/AIDS knowledge, exposure to mass media, and stigmatizing behaviors among young women aged 15–24 years in Ghana. Global health action, 10(1), 1331538.Aung, W. C., Ding, K., & Farmer, S. (2008). Knowledge, attitudes, and behaviors related to HIV and AIDS among college students in Taiwan. Journal of the Association of Nurses in AIDS Care, 19(5), 397-408.

Bacon, D. R., Sauer, P. L., & Young, M. (1995). Composite reliability in structural equations modeling.

Educational and Psychological Measurement, 55(3), 394-406.

Bagozzi, R., & Yi, Y. (1988). On the evaluation of structural equation models. Journal of the Academy of Marketing Science, 16, 74-94. doi:10.1007/bf02723327..

Bankole, A., Singh, S., Woog, V., &Wulf, D. (2004). Risk and protection: youth and HIV/AIDS in sub-Saharan Africa. New York: The Guttmacher Institute.

Barry, T. E. (1987). The development of the hierarchy of effects: An historical perspective. Current Issues and Research in Advertising, 10(1-2), 251-295.

Bekalu, M. A., &Eggermont, S. (2013). Media use and HIV/AIDS knowledge: a knowledge gap perspective. Health Promotion International, 29(4), 739-750.

Bijttebier, P., Delva, D., Vanoost, S., Bobbaers, H., Lauwers, P., &Vertommen, H.(2000). Reliability and validity of the critical care family needs inventory in aDutch-speaking Belgian sample. Heart & Lung: The Journal of Acute and Critical Care, 29, 278-286. doi:http://dx.doi.org/10.1067/mhl.2000.107918.

Bouanchaud, P. (2011). Scaling knowledge, attitudes, practices and media exposure – are migrants at increased risk of HIV in China? London:Migration Studies Unit Working Papers. London School of Economics and Political Science. Available at http://www.lse.ac.uk/government/research/resgroups/MSU/documents/workingPapers/WP_2011_08.pdf

Brodie, M., Hamel, E., Brady, L. A., Kates, J., & Altman, D. E. (2004). AIDS at 21: Media coverage of the HIV epidemic 1981-2002. Columbia Journalism Review, 42(6), A1.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. Modern methods for business research, 295(2), 295-336.

Cochran G. W.(1977). Sampling techniques, Toronto: Willey Publications.

Duarte, P. A. O., &Raposo, M. L. B. (2010). A PLS model to study brand preference: An application to the mobile phone market. In Handbook of partial least squares(pp. 449-485). Pringer Berlin Heidelberg.Falk, R. F., & Miller, N. B. (1992). A primer for soft modeling. Ohio: The University of Akron Press.

Fornell, C., &Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research 18, 39-50.

Gańczak, M., Barss, P., Alfaresi, F., Almazrouei, S., Muraddad, A., & Al-Maskari, F. (2007). Break the silence: HIV/AIDS knowledge, attitudes, and educational needs among Arab university students in United Arab Emirates. The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine, 40(6), 572.e1–8.

Gemeda, T. T., Gandile, A. U., &Bikamo, D. S. (2017). HIV/AIDS knowledge, attitude and practice among Dilla University Students, Ethiopia. African Journal of Reproductive Health, 21(3), 49-61.Götz, O., Liehr-Gobbers, K.,

&Krafft, M. (2010). Evaluation of structural equation models using the partial least squares (PLS) approach. In Handbook of partial least squares (pp. 691-711). Springer Berlin Heidelberg.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). Multivariate data analysis (6th ed.). Upper Saddle River, NJ: Pearson/PrenticeHall.

Hair, J. F., Hult, G. T. M., Ringle, C. M., &Sarstedt, M. (2014). A primer on partial least squares structural equation modeling (PLS-SEM). Thousand Oaks: Sage Publications.

Hair, J. F., Ringle, C. M., &Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. Journal of Marketing Theory and Practice, 18, 139-152.

Hanan, M. A. (2009). HIV/AIDS prevention campaigns a critical analysis. Canadian Journal of Media Studies, 5(1), 129-158.

Hayduk, L. A., &Littvay, L. (2012). Should researchers use single indicators, best indicators, or multiple indicators in structural equation models?. BMC medical research methodology, 12(1), 159.

Hirose, H., Nakaune, N., Ishizuka, T., Tsuchida, S., &Takanashi, Y. (1998). A study on the role of AIDS mass communication: How do the mass media affect HIV testing behavior?. Japanese psychological research, 40(4), 246-255.

Jobber, D. (1989). An examination of the effects of questionnaire factors on response to an industrial mail survey. International Journal of Research in Marketing, 6(2), 129-140.

Johns, R. (2010). Likert items and scales. Colchester: University of Essex.

Larkin, B. (2004). Degraded images, distorted sounds: Nigerian video and the infrastructure of piracy. Public Culture, 16(2), 289-314.

Launiala, A. (2009). How much can a KAP survey tell us about people's knowledge, attitudes and practices? Some observations from medical anthropology research on malaria in pregnancy in Malawi. Anthropology Matters, 11(1).1-13.

Lee, C. J., Hornik, R., & Hennessy, M. (2008). The reliability and stability of general media exposure measures. Communication Methods and Measures, 2(1-2), 6-22.

Letamo, G. (2011). Does correct knowledge about HIV and AIDS lead to safer sexual behaviour? The case of young people in Bostwana. Journal of African Population Studies 25 (I) ,44-62.

Li, L., Rotheram-Borus, M. J., Lu, Y., Wu, Z., Lin, C., & Guan, J. (2009). Mass media and HIV/AIDS in China. Journal of Health Communication,14(5), 424-438.

Mahtab, M. (2010). Knowledge, attitude and practice related to hiv/aids prevention among secondary school students in Klang, Malaysia (Unpublished Master thesis, Universiti Putra Malaysia. Community Health Department).

Moore, D. (2008). HIV/AIDS knowledge, attitudes, involvement, and predictors of condom use among African American college students: implications for communication strategies for HIV/AIDS prevention (A Doctoral dissertation, Bowling Green State University).

Naugle, D. A., &Hornik, R. C. (2014). Systematic review of the effectiveness of mass media interventions for child survival in low-and middle-income countries. Journal of health communication, 19(sup1), 190-215.

Nubed, C. K., &Akoachere, J. F. T. K. (2016). Knowledge, attitudes and practices regarding HIV/AIDS among senior secondary school students in Fako Division, South West Region, Cameroon. BMC public health, 16(1), 847.

Nubed, C. K., &Akoachere, J. F. T. K. (2016). Knowledge, attitudes and practices regarding HIV/AIDS among senior secondary school students in Fako Division, South West Region, Cameroon. BMC public health, 16(1), 847.

Rahnama, Rozina (2009) Knowledge, attitude and practices related to Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome Among students in Universiti Putra Malaysia. (A Masters thesis, Universiti Putra Malaysia. (FPSK(M) 2009 1).

Salkind, N. J. (1997). Exploring research (3rd ed.). Upper Saddle River, NJ: Prentice

Sekaran, U. (2003). Research methods for business (4th ed.). Hoboken, NJ: John Wiley & Sons.

Shokoohi, M., Karamouzian, M., Mirzazadeh, A., Haghdoost, A., Rafierad, A. A., Sedaghat, A., &Sharifi, H. (2016). HIV knowledge, attitudes, and practices of young people in Iran: findings of a national population-based survey in 2013. PloS One, 11(9), e0161849.

Thomson, C., Currie, C., Todd, J., & Elton, R. (1999). Changes in HIV/AIDS education, knowledge and attitudes among Scottish 15–16 year olds, 1990–1994: findings from the WHO: Health Behaviour in School-aged Children Study (HBSC). Health Education Research, 14(3), 357-370.

Tompson, R., Barclay, D. W., & Higgins, C. A. (1995). The partial least squares approach to causal modeling: Personal computer adoption and uses as an illustration. Technology Studies: Special Issue on Research Methodology, 2(2), 284-324.Tomaselli, K.G. (1997). Action research, participatory communication: Why governments don't listen. Africa Media Review. 11(1). 1-9.

Ugande, G.B. (2007). Radio Benue and HIV/AIDS awareness creation in Vandiekya local government area of Benue State: An Evaluation. A Paper presented at ACCE Conference, Zaria 2007.

UNAIDS, (2004). Media and HIV/AIDS: Making the Difference. Retrieved from http://data.unaids.org/publications/irc-pub06/jc1000-media_en.pdf

Xiao, Z., Li, X., Lin, D., & Tam, C. C. (2015). Mass media and HIV/AIDS prevention among female sex workers in Beijing, China. Journal of Health Communication, 20(9), 1095-1106.

Zhou, J. F., Sun, X. M., Mantell, J., Ru, X. M., & Yong, W. E. N. (2007). AIDS-related knowledge, attitudes and behavior survey among the “migrant” population in China. Journal of Reproduction and Contraception, 18(2), 155-162.