ORIGINAL RESEARCH ARTICLE

Perception of Risk of HIV among Adolescents' Living in an Urban Slum in Ghana

Eugene K. M. Darteh, Akwasi Kumi-Kyereme and Kofi Awusabo-Asare*

Department of Population and Health, University of Cape Coast, Cape Coast, Ghana.

***For Correspondence**: *E-mail: edarteh@ucc.edu.gh*; Phone: +233243717014

Abstract

Due to a number of biological, social, developmental, and behavioural factors young people are disproportionately affected by STIs including HIV and AIDS. Using the Health Belief Model, the study investigated factors influencing perception of risk of HIV among adolescents living in an urban slum in Ghana. Data were obtained from 902 adolescents, aged 10-19 years living in Kwesimintsim Zongo, an urban slum in the Western region of Ghana. A multi-staged sampling technique was used to select the respondents and both bivariate and multivariate analyses were carried out to examine the factors influencing perception of risk of HIV among adolescents. Adolescents' perception of risk of HIV was generally low and was predicted by age, ethnicity, membership of social groups and exposure to the print media. The low risk perception might cause adolescents to engage in behaviours, which are likely to endanger their health in general, and reproductive health in particular. Considering the effects of HIV and AIDS on young people, it is imperative to put in place campaigns that would help to increase their perceived risks of HIV. Factors that affect adolescents' perception of risks should be taken into consideration in designing HIV and AIDS campaigns to ensure positive behavioural change. *(Afr J Reprod Health 2016; 20[1]: 62-70).*

Keywords: HIV; risk perception; adolescents; urban slum; Ghana.

Résumé

En raison d'un certain nombre de facteurs biologiques, sociaux, de croissances et des facteurs du comportement, des jeunes sont touchés de manière disproportionnée par les IST y compris le VIH / SIDA. A l'aide du modèle de croyance de la santé, l'étude a examiné les facteurs qui influent sur la perception du risque du VIH chez les adolescents domiciliés dans un bidonville urbain au Ghana. Les données ont été recueillies à partir de 902 adolescents, âgés de 10-19 ans domiciliés à Kwesimintsim Zongo, un bidonville urbain dans la région ouest du Ghana. Une technique en plusieurs étapes d'échantillonnage a été utilisée pour sélectionner les interviewés et les deux analyses bivariées et multivariées ont été menées pour examiner les facteurs qui influent sur la perception du risque du VIH chez les adolescents. La perception des adolescents du risque du VIH était généralement faible et a été prédit par l'âge, l'origine ethnique, l'appartenance à des groupes sociaux et l'exposition à la presse écrite. La faible perception du risque pourrait influencer des adolescents à se livrer à des comportements qui sont susceptibles de mettre en danger leur santé en général, et la santé de la reproduction en particulier. Compte tenu des effets du VIH et du SIDA sur les jeunes, il est impératif de mettre en place des campagnes qui permettraient d'accroître leurs risques perçus à l'égard du VIH. Les facteurs qui affectent la perception des risques chez les adolescents doivent être pris en considération dans la conception de campagnes du VIH et du SIDA pour assurer un changement de comportement positif. *(Afr J Reprod Health 2016; 20[1]: 62-70).*

Mots-clés: VIH; perception du risque; adolescents; bidonville urbain; Ghana

Introduction

Globally, 34 million people were living with HIV at the end of 2011[1]. Sub-Saharan Africa remains most severely affected, with nearly 1 in every 20 adults (4.9%) living with HIV and accounting for 69% of the people living with HIV worldwide[1]. The regional prevalence of HIV infection is nearly 25 times higher in sub-Saharan Africa than in Asia[1]. The 2012 HIV/AIDS sentinel survey reported a median prevalence of 2.1% for Ghana[2], with HIV been described as a generalised epidemic[2]. Over 80% of all infections are transmitted through sexual intercourse[2]. Estimates put prevalence among young people aged 15–19 years at 0.7% and those aged 15-24 (a population who was used as proxy for new infection) at 1.3% in 2012. Also, prevalence in urban areas (2.8%) was higher than that of rural areas (2.6%)[2]. This epidemic is fuelled by sexual risk-taking behaviours, as in many parts of sub-Saharan

Africa. Owing to a number of biological, social, developmental, and behavior factors, youth are disproportionately affected by STIs including HIV & AIDS[3]. This situation calls an understanding perception of risk of HIV infection and its determinants among adolescents; as a way of contributing to the discourse on perception of risk of HIV especially among adolescents living in urban slums in Ghana.

There is evidence that young people are aware of the perception of risks of HIV transmission associated with unprotected sexual intercourse[4,5]. A study in Ibadan among urban dwellers established that they have a high-risk perception of contracting the virus[5]. However, perception of sexual and reproductive health risk has not been consistent with behaviour in a number of studies[5-8]. Gender differentials have been noted in perception of risk of HIV among adolescents. For instance, Akwara et al.[9], established that males had a higher risk perception than females while others have shown the reverse[10-13]. Studies have also, identified other correlates of HIV risk perception. For instance, a study in the slums of Nairobi, established a relationship between schooling and HIV risk perception with young people in school living in slums being less likely to perceive themselves at risk of HIV[14].

Using the health belief model, the current study examined risk perception of HIV, an issue that affects young people's behaviour towards HIV. It contributes to the discourse on HIV among young people by examining the factors that influence perception of risk of HIV among adolescents living in an urban slum in Ghana.

Conceptual Framework

The Health Belief Model (HBM) was developed to study health-seeking behaviour in the United State' in 1950. It hypotheses that health related actions depend upon the concurrent occurrence of three factors: the existence of sufficient motivation to make health salient; the belief of a perceived threat to health; and the belief that following a particular health recommendation would be beneficial in reducing a perceived threat[15-17].

The key variables of the HBM include: perceived susceptibility of an individual to a health problem, perceived severity of the problem, perceived threat, perceived benefits of strategies, perceived barriers to effective action, and cues to action (See Figure 1). HBM constructs have been used to study HIV risk among youth. For example, a study by Lin et al.[18], found self-efficacy as the strongest HBM predictor of HIV risk behaviour[18]. Other variables used in the model are socio-demographic such as age, education, sex, ethnicity and self-efficacy[19-20]. Variations to the model have emerged after the initial conceptualisation, including the social learning theory[21-22], later re-named as Social Cognitive Theory, the Theory of Reasoned Action[22], the Theory of Planned Behaviour[23], and the Interactional Framework[25-26].

One of the strengths of the HBM is that it has direct implications for intervention designs. Also, the model provides a profile of the beliefs of the population under study to allow for relevant and efficient interventions[27]. Also, it makes testable predictions such as large threats might be offset by perceived costs whilst small threats might attract large benefits.

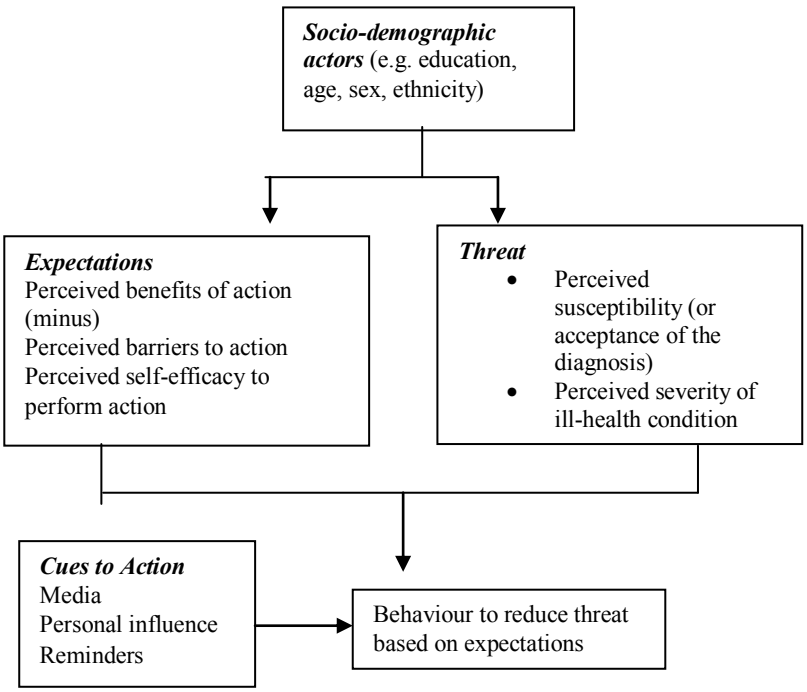
The model has been criticised because researches that have used the model have included only selected components of the model thereby not testing the whole model[28]. Secondly, as a psychological model it does not take into consideration such as environmental or economic factors that influence health behaviour.

The variables used for the study were socio-demographic characteristics: age, sex, level of education, religious affiliation, ethnicity, marital status, place of origin, co residence and involvement in economic activities, perceived susceptibility, perceived risk of HIV, reasons for perception of risk and efforts at dealing with risk.

Methods

Primary data from adolescents' living in Kwesimintsim Zongo – a slum community in Takoradi, the regional capital of the Western region of Ghana was used for this paper. The study broadly targeted adolescents aged 10-19 years living in Kwesimintsim Zongo. The estimated population for the Kwesimintsim Zongo was 10775 in 2010[29]. Based on this, the population of adolescents' was estimated at about 2155 (20% of

Figure 1: Health Belief Model



Source: Rosenstock et al., 1994

the estimated population).

A total of 902 (424 males and 478 females) adolescents' living in the community were used for the study. A multi-staged sampling technique was used to select the study population. The 2010 Population and Housing Census divided the suburb into 15 Enumeration Areas (EAs). These 15 EAs were grouped into five clusters with each having between one to six EAs. Using simple random sampling, a total of eight EAs were selected from the five clusters. Three EAs were selected from the cluster with six EAs; two were selected from the cluster with four EAs and one EA each of the 3 remaining clusters. Samples were allocated to each EA, based on proportional allocation. Structures in each selected EA were listed. Using the EA bases as reference points, every third structure/house was systematically selected in each cluster. Members in the households in the selected structures/houses were listed. Using the household lists, adolescents aged 10-19 years living in the area were identified and this constituted the sampling frame for the study. Simple random sampling was then used to select households with adolescents for the study. In situations where there were more than one adolescent in the household, one was chosen randomly to respond to the questionnaire.

A questionnaire, which had both open and closed ended questions, was used to obtain data from the respondents. In designing the questions, a literature search was conducted on the topic to identify relevant questions and concepts on sexual and reproductive health among adolescents. Questions from different studies[30-31] conducted on reproductive health in general and adolescent reproductive health informed the current study. The rationale for adopting and adapting aspects of questionnaires used in previous studies was to ensure that the variables used conformed to standardised meaning and measurements. Also, it was to ensure reliability and validity. Adolescents aged 15-19 years were made to complete consent forms whilst consent for those aged less than 15 years was sought from their parents and guardians. Subjects who were used in the study were assured of anonymity and confidentiality. At the time of the study no functional Institutional Review Board existed at our institution. Ten trained field assistants (mainly graduate students) collected data

for the research over a period of two weeks (15th – 29th May, 2011).

Table 1: Socio-Demographic Characteristics of Respondents

Variables	Sex					
	Males			Females		
	10-14	15-19	Total	10-14	15-19	Total
Highest level of education						
No education	0.00	2.4	1.2	0.8	1.4	1.1
Primary	71.4	11.3	42.4	71.8	9.7	43.7
Junior High School	27.3	45.6	36.1	27.4	38.9	32.6
Senior High School	1.3	39.2	19.6	0.0	48.6	22.0
Tertiary	0.0	1.5	0.7	0.0	1.4	0.6
Ethnicity						
Fante	37.7	45.1	41.3	34.0	30.1	32.2
Ashante	16.4	12.8	14.6	19.1	21.3	20.1
Ewe	5.9	3.4	4.7	6.1	7.9	6.9
Ga-Adangbe	2.3	4.4	3.3	4.6	3.2	4.0
Nzema	7.3	5.4	6.4	5.0	6.5	5.7
Ahanta	7.7	7.8	7.8	11.8	10.2	11.1
Mole-Dagbani	20.4	18.1	19.3	17.2	17.1	17.1
Non-Ghanaian	2.3	3.0	2.6	2.2	3.7	2.9
Religious Affiliation						
Catholic	13.6	9.8	11.8	12.2	9.3	11.0
Protestant	16.4	22.1	19.1	21.4	21.3	21.3
Pentecost/Charismatic	46.8	42.6	44.8	38.6	46.3	42.0
Other Christians	8.2	4.9	6.6	7.6	9.3	8.4
Muslims	14.1	17.2	15.6	19.1	12.9	16.3
Others	0.9	3.4	2.1	1.1	0.9	1.0
Marital Status						
Married	0.0	0.5	0.2	0.0	5.1	2.3
Not married	100.0	99.5	99.8	100.0	94.9	97.7
Risk of contracting HIV						
Yes	11.1	20.8	15.5	7.7	26.0	16.5
No	88.9	79.2	84.5	92.3	74.0	83.5

Data processing including data entry and cleaning was done using the Statistical Product for Service Solutions (SPSS) version 21. The management and analysis were done using STATA version 14. Simple bivariate tables were used to present the data to show the relationship between the variables and three sequential logistic regression models were used to examine the predictors of perception of risk of HIV. The specific aspects of the conceptual framework on which data was collected for the study included: background characteristics, exposure to mass media, perceived susceptibility and the outcome of the behaviour. HIV risk perception was measured by asking respondents to answer the question 'Do you consider yourself to be at risk of contracting HIV?' The outcome variable was coded No=0 and Yes=1. The explanatory variables used for the logistic regression were background factors – age, sex, level of education, place of origin, ethnicity and religion; contextual factors – co-residence with adult figures, member of social groups and involvement in economic activities in the last 7 days and exposure to mass media channels. Model I was an incomplete model which featured background factors such as age, sex, level of education, place of origin, ethnicity and religion. In model II, three contextual factors – co residence with adult figures, member of social groups and involvement in economic activities in the last 7 days were added to the variables in model 1 to estimate their effect on perception of risk among adolescents. The final model was a full model which consisted of all the variables, used in in models I and II and variables on adolescents exposure to mass media channels.

Results

Background characteristics of adolescents

Of the 902 interviewed, 47% were males and the rest females, indicating that the sample size was

Table 2: Logistic Regression Analysis of Perception of Risk of HIV

Variables	Model I Odds Ratio	Model II Odds Ratio	Model III Odds Ratio
Sex of Respondents			
Females (Ref)			
Males	1.07	1.051	1.08
Age of Respondents			
10-14	Ref		
15-19	1.84**	1.65*	1.69**
Level of Education			
No education (Ref)			
Primary	0.62	0.59	0.29
Junior High/Middle	1.31	1.28	0.58
Secondary/Higher	1.45	1.43	0.59
Place of origin			
Village (Ref)			
Town	0.59	0.59	0.55
City	1.03	1.06	0.96
Religion			
No religion (Ref)			
Catholic	0.54	0.52	0.47
Protestants	0.86	0.81	0.73
Charismatic/Pentecostal	0.69	0.68	0.61
Other Christians	0.83	0.77	0.67
Muslims	0.58	0.58	0.48
Ethnicity			
Ga-Adangbe (Ref)			
Fanti	4.30**	4.34**	4.86**
Ewe	8.91**	9.32**	9.85**
Nzema	6.65**	7.08**	7.89**
Ahanta	8.71**	8.71**	9.59***
Mole-Dagbani	7.25**	7.52**	9.35***
Co-residence with biological parent			
No (Ref)			
Yes	-	0.88	0.86
Membership of social group			
No (Ref)			
Yes	-	1.58**	1.52*
Economic activity in last 7 days			
No (Ref)			
Yes	-	1.31	1.29
Exposure to mass media			
Radio			
No (Ref)			
Yes	-	-	0.70
Television			
No (Ref)			
Yes	-	-	1.54
Print – Newspaper/magazine			
No (Ref)			
Yes	-	-	2.02***
Pseudo R^2	0.0790	0.0848	0.1053
Prob > X^2	0.000	0.000	0.000

*p<0.10 **p<.05 ***p<.001 OR=Odds ratio; ref=reference

skewed towards females. The mean age of the respondents was 14.4 years (males 14.4 years and females, 14.3 years). Forty-two percent of the males and 44% of the females had completed

primary school education with 36% and 33% of males and females respectively completing junior high school. More than 98% of both male and female adolescents had had formal education with the highest education being the attainment of tertiary education among 1.5% of males and 1.2% of females aged 15-19 years (Table 1). Kwesiminstim Zongo hosts people from the major ethnic groups in the country. The predominant ones were Fanti (41% males and 32% females), Ashanti (15% males and 20% females) and Mole-Dagbani (19 % males and 17% females). There were variations in the ethnicity of older and younger adolescents (See Table 1). The results also show that there was a high concentration of people of the Mole-Dagbani ethnic group. This could be as a result of migration into the city.

Christianity is the most predominant religion among the young people in the area. Four out of 10 respondents reported being Pentecostals/ Charismatic (43.4%) and 20% were Protestants (19.1% males and 21.3% females). Sixteen percent of the adolescents interviewed were Muslims (15.6% males and 16.3 % females). Only 0.2% of males and 2.3% of females had ever married. The few who were married were females aged 15-19 years.

HIV risk perception was generally low among the adolescents. For instance, 15% of females and 16% of males perceived themselves at risk of HIV. The main reason cited by those who perceived themselves at risk was that they were sexually active (70 % males and 59% of the older adolescents) (data not shown). About 57% of females and 47% of males indicated that they were abstaining from sex with another 12% females and 20% of the males indicating that they were using condoms as a way of reducing their risk of contracting HIV (data not shown).

Multivariate analysis

Three sequential logistic regression models were used to establish the relationship between the explanatory variables such as socio-demographic characteristics, economic activities, living arrangements, membership of social groups and exposure to mass media channels and the outcome variables – perception of risk of HIV. Model I, controlled for the effects of economic activities, living arrangement, membership of social groups and exposure to mass media channels. The sequential regression was employed to determine the factors that significantly predict perception of risk of contracting HIV among adolescents. The results are presented in Table 2.

The pseudo R^2 value for model I was 0.0790. It increased steadily with each succeeding model. Overall, model II which consists of background and contextual factors emerged as the best predictor of perception of risk of contracting HIV among adolescents in Kwesimintsim. The variables that come out significantly under this model were age, ethnicity and membership of social groups.

The results suggest that older adolescents were more likely to consider themselves at risk of contracting HIV compared to the younger ones aged 10-14 years (OR=1.8, $p<0.05$). The likelihood of perception of risk of HIV varied by ethnicity. For instance, Ewes were more likely to perceive themselves at risk of HIV than the reference (Ga-Adangbe) (OR=8.9, $p<0.05$). In the case of membership of social group, it was observed that adolescents' who were members of these groups were more likely to perceive the risk of HIV compared to those who did not belong to any groups (OR= 1.6, $p<0.05$) (See Table 2).

There was a significant relationship between exposure to mass media channels and perception of risk of HIV although this varied by type of channel (Model III). For instance, adolescents exposed to the print media were more likely to perceive themselves to be at risk of HIV infection compared to those with no exposure (OR=2.0, $p<0.001$).

Discussion

Using the Health Belief Model, the study sought to examine the correlates of perception of risk of HIV among adolescents living in an urban slum in Ghana. The study focused on examining the correlates of perception of risk of HIV among adolescents in an era of HIV. Socio-demographic factors such as age, ethnicity and sex were found to be significantly correlated with perception of risk of HIV among adolescents. Also, perception of risk of HIV was predicted by factors such as age, ethnicity, membership of social groups and exposure to print media.

The study observed low perception of risk of

HIV among adolescents. This finding is consistent with findings of other studies[13,29,30,31]. This finding, however, is inconsistent with that of Adedimeji[5] who found in a study in Ibadan that 58% of males and 36% of females perceiving HIV risks. This low risk perception could be due to the fact that more than two thirds of the respondents were not sexually active and also because adolescents vulnerability to HIV infection was low[31].

Studies have established gender disparities in sexual and reproductive health risk with some reporting higher risk perceptions among males[5,8] and others females[9-13]. Gender disparities in HIV risk perception were observed with more males (16%) than females (15%) reporting HIV risk. This finding is consistent with studies by Adedimeji[5] and Akwara et al.[9], that higher risk perception exists among males than females. The high perception of risk of HIV could be as the result of the fact that more males were involved in sexual intercourse than females (results not shown). Also, the socio-cultural values of the area are seemingly liberal when it comes to sexual behaviour of males.

Different socio-demographic factors accounted for adolescents risk perception. For instance, older adolescents were about 1.8 times more likely to consider themselves at risk of contracting HIV compared to the reference. The higher risk perception among older adolescents could be as a result of their level of sexual activity. This finding corroborates that of Adedimeji, et al.[4], who found in their study in Nigeria that older adolescents had a higher risk of perception than their younger counterparts[4]. Ewes were more likely to perceive themselves at risk of HIV than the reference category (Ga-Adangbe). There is the need to undertake further studies to explore this relationship because no plausible explanation comes to mind immediately. It was observed that adolescents' who were members of social groups were more likely to perceive the risk of HIV compared to those who did not belong to any group. This relationship could be as a result of some positive influences from these groups. Adolescents exposed to the print media were more likely to perceive themselves to be at risk of HIV infection compared to those with no exposure. This study is limited by its cross-sectional nature and hence causal inferences cannot be made. Despite the above limitation, the study has some strength. First, the large sample size gave the study sufficient power. Also, the representativeness of the sample enhances the study's generalisability to other locations.

Conclusion

The study investigated factors influencing perception of risk of HIV among adolescents living in an urban slum in Ghana using the Health Belief Model. The perception of risk of HIV among adolescents was generally low. Risk perception was predicted by some socio-demographic variables including age, ethnicity, membership of social group and exposure to the print media. It is imperative to put in place campaigns, which would help to increase adolescents' perceived risks. This is because low risk perception might cause adolescents to engage in behaviours that are likely to endanger their health in general and reproductive health in particular. The factors, which affect adolescents risk perception, should be taken into consideration in designing the campaigns to ensure positive behavioural change.

Conflict of interests

The authors declare none.

Authors' contribution

EKMD conceived the study, designed the study, collected the data, conducted data analysis and interpretation as well as drafted the first version of the manuscript. EKMD and AKK conducted the initial literature scoping and searches EKMD, AKK and KAA revised the manuscript for important intellectual content. All authors have read and approved the final manuscript.

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