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Full Length Research Paper

Socio-demographic factors affecting HIV/AIDS in Kasungu District Malawi: A descriptive cross section study

Jamie Yoon^{1*}, Kunmin Kim¹, Subin Lim², David S. Chung³, Sarah Lee⁴, Rebecca Chung⁵, and Seohyeon Park⁶, James Kachingwe⁷, and George Talama⁷

¹Division of Biological Sciences, UC San Diego, La Jolla, CA 92093, USA.

²College of Arts and Sciences, University of Virginia, Charlottesville, VA 22901, USA.

³Division of Biology & Medicine, Brown University, Providence, RI, 02912 USA.

⁴College of Arts and Sciences, Vanderbilt University, Nashville, TN 37235, USA.

⁵Centreville High School, Clifton, VA 20124, USA.

⁶Portland Christian School, Portland, OR 97230, USA.

⁷Kasungu District Hospital, Kasungu, Malawi.

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More than 70 million people have been infected worldwide with the HIV virus from the start of the epidemic, and since then, nearly 35 million people have died of HIV. Sub-Saharan Africa remains the most severely affected area, accounting for nearly 70% of the people living with HIV worldwide. Approximately 8.8% of women and men age 15 to 49 in Malawi are HIV positive. Socio-demographic factors affecting the HIV/AIDS epidemic in Kasungu district in Malawi are currently unknown. This study aimed to determine the main socio-demographic factors affecting HIV/AIDS propagation and its treatment in Kasungu district in central Malawi. A descriptive cross sectional study involving 1260 adult participants (aged 18+) living with HIV at both the Kasungu District Hospital and St. Andrew's Hospital was conducted. HIV was common among non-pregnant females (40.9%) compared to pregnant females, (19.3%). HIV was also more common among non-pregnant females than men (40.9% vs. 39.6%, respectively). In general, HIV was more common among farmers (38.5%) and businessmen (24.5%). The main reason for starting anti retro viral (ARV's) was a low CD4 count, seconded by World Health Organization (WHO) clinical stage 3. Nine out of 11 clients had negative reactions towards their HIV positive serostatus. Seven out of 11 clients had thoughts related to suicide or attempted suicide. About 50% of the surveyed patients revealed that they had experienced discrimination due to their HIV positive status.

Key words: HIV/AIDS, demographic factors, social factors.

INTRODUCTION

Since the beginning of the HIV epidemic, more than 70 million people have been infected with the virus and about 35 million people have died of HIV. Prevention

programs such as massive expansion of antiretroviral therapy (ART) have reduced the global number of people dying from HIV-related causes to about 1.1 million in

2015, which is 45% fewer than in 2005, when HIV-related mortality peaked (WHO Progress Report, 2016). The Joint United Nations Programme on HIV/AIDS (UNAIDS)/World Health Organization (WHO) estimates show that more than 18 million people were receiving ART in mid-2016. 2020 Fast-Track targets have been set to accelerate the HIV response towards ending the AIDS epidemic by 2030. These Fast-Track targets apply to everyone: children, adolescents and adults; rich and poor; women and men; and all key populations including sex workers, people who inject drugs, men who have sex with men, transgender people and prisoners. The Fast-Track targets include the 90-90-90 target: 90% of the people living with HIV know their HIV status, 90% of the people who know their HIV-positive status and are accessing treatment, and 90% of the people receiving treatment with suppressed viral loads (WHO, 2016). Sub-Saharan Africa remains the most severely affected, with nearly 1 in every 25 adults (4.4%) living with HIV and accounting for nearly 70% of the people living with HIV worldwide (WHO, 2016).

The 2015-2016 Malawi Demographic and Health Survey found that approximately 8.8% of women and men age 15 to 49 in Malawi are HIV positive. The HIV prevalence is higher among women than men (10.8% versus 6.4%) (Malawi Demographic and Health Survey, 2015-16). HIV/AIDS is more prevalent among sex workers, people who inject drugs, men who have sex with men, transgender people, and prisoners.

In Malawi, reactions, misconceptions, and discrimination status of clients who are newly diagnosed to be HIV positive vary from population to population. At present, the socio-demographic factors affecting HIV/AIDS epidemic in Kasungu district are largely unknown and undocumented. Also we were not aware of whether discrimination was an issue of concern in HIV/AIDS management in Kasungu district or not.

Main objective

To determine socio-demographic factors affecting HIV/AIDS and its treatment in Kasungu district.

Specific objectives

1. To evaluate socio-demographic factors that affect HIV/AIDS in Kasungu district.
2. To investigate the socio-demographic factors affecting the quality of care and life of HIV/AIDS clients in Kasungu district.

MATERIALS AND METHODS

Study setting, population, eligibility criteria and data analysis

This was a descriptive cross section study which was conducted at Kasungu district and St. Andrew's Hospitals in 2016. It involved a total of 1,260 adult participants (aged 18+) living with HIV; 981 participants were from Kasungu hospital, and 279 participants were from St. Andrew's Hospital. Kasungu District Hospital has a bed capacity of 217 beds and offers both primary and secondary care services. Its catchment population is approximately 150,000 people. St Andrews Hospital has a catchment population of approximately 40,000 people and offers both primary and secondary care services. HIV prevalence in Kasungu District is 4.6% which is lower than the country's prevalence of about 10%. To achieve the objectives, HIV/AIDS Registry data from Anti-retroviral therapy (ART) and HIV Testing and Counselling (HTC) clinics were extracted manually. The registers were made available to the data collectors by the leadership from both institutions. The 2014 to 2016 registry was used to extract the data from 1st January, 2014 to 31st December, 2016. From the ART register, number of males and females on ART for the period under review was extracted. Reasons for starting ART for each individual on ART were extracted as well. Socio-economic status of each individual on ART was also extracted. Microsoft Excel was used to enter and analyse the data. Tables, bar charts and pie charts were created to present the results.

RESULTS

HIV was common among non-pregnant females (40.9%) compared to pregnant females, (19.3%). HIV was more common among non-pregnant females than men (40.9 vs. 39.6%, respectively). Overall, HIV was common among females compared to males, Figures 1 and 2, and the younger demographic was mainly affected by HIV; such that HIV was most common within the ages of 20 to 50 years, Figure 3. Overall, the main reason for starting ARV was a low CD4 count, seconded by symptoms from WHO clinical stage 3 (Figures 4 and 5). Among females, the main reason for starting ART was a low CD4 count seconded by HIV in pregnancy. HIV was more common among farmers (38.5%) and Business people (24.5%).

DISCUSSION

This study revealed that HIV in Kasungu district was more common among females than males, 40.9% vs. 39.6%, respectively. This finding is consistent with MDHS 2015-16 findings whereby the HIV prevalence was also higher among women than men (10.8% versus 6.4%). Compared to men, women are often powerless to negotiate safe sex properly - this is a common phenomenon in several African countries, especially

*Corresponding author. E-mail: paulschung08@gmail.com.

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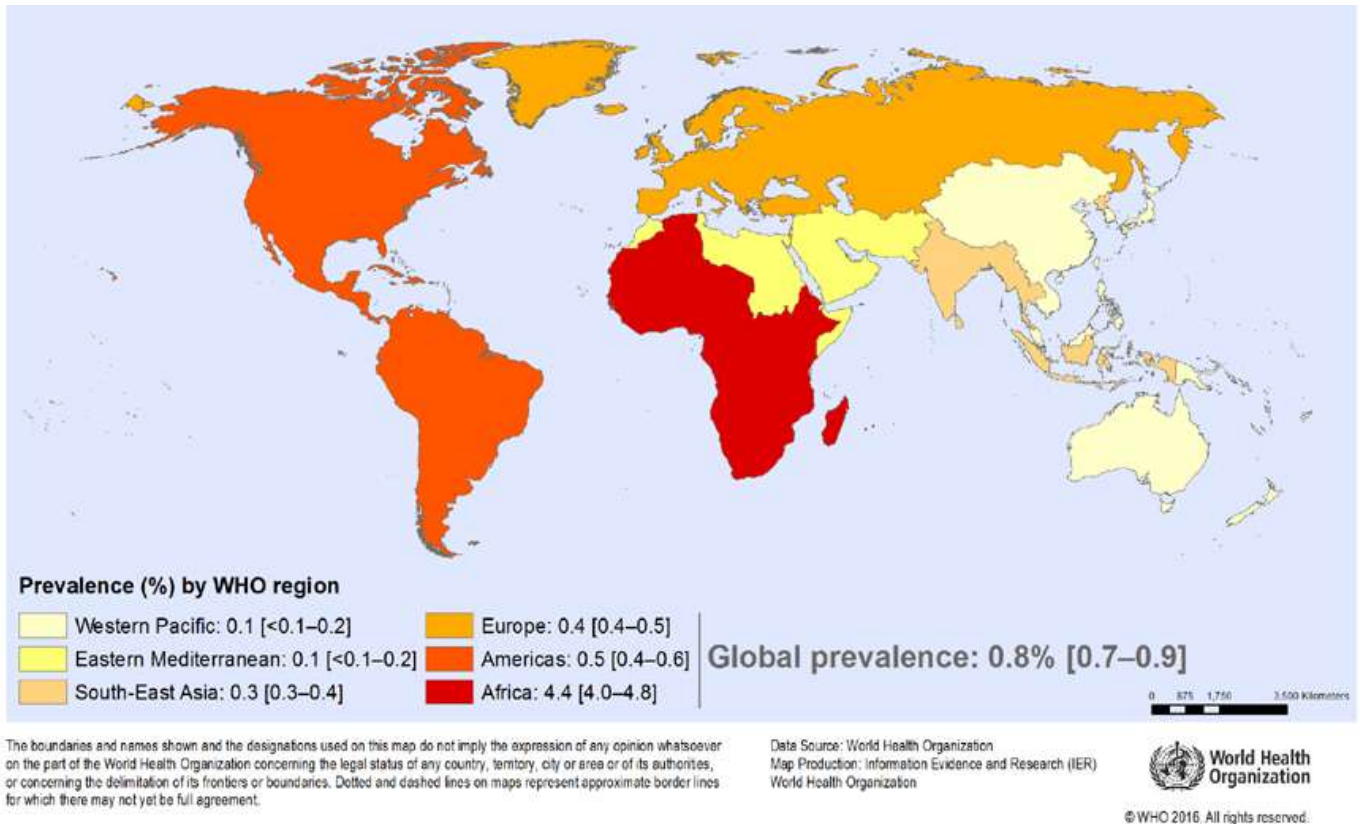


Figure 1. Adult HIV prevalence (15-49 years), 2015 by WHO region

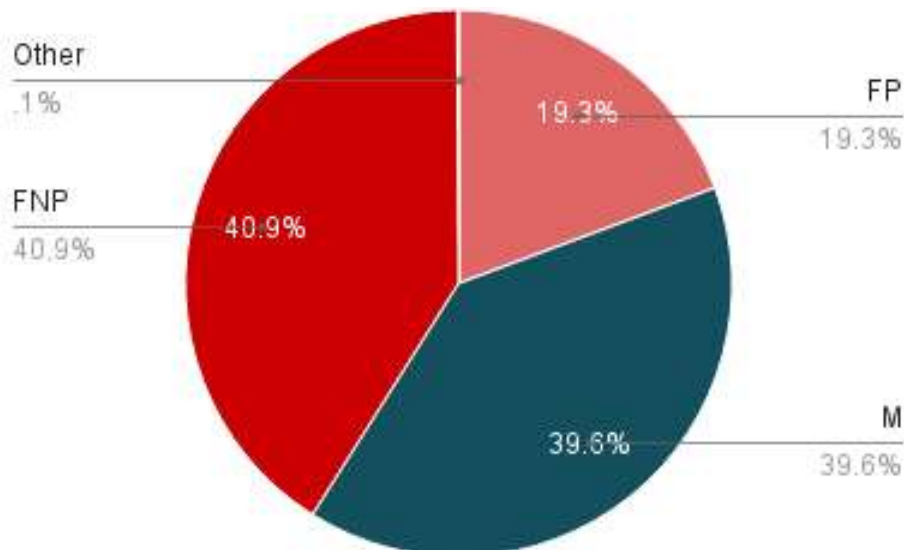


Figure 2. Number of male vs. female HIV positive patients in KDH, 2014-2016. FP = Pregnant females; FNP = Non-pregnant females; M = Males

amongst poorer rural populations (Ung et al., 2014). The results indicated that the main reason for patients starting ARV was a low CD4 count followed by WHO clinical

stage 3 symptoms. This finding is due to the fact that this survey was conducted before UNAIDs rolled out the “Test All Treat All” campaign in 2016, whereby everyone who

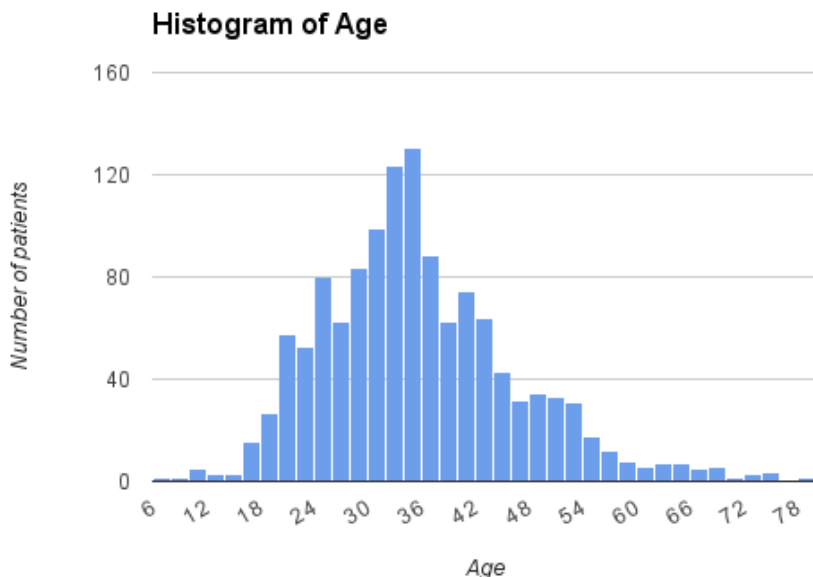


Figure 3. Relationship between age and number of participants

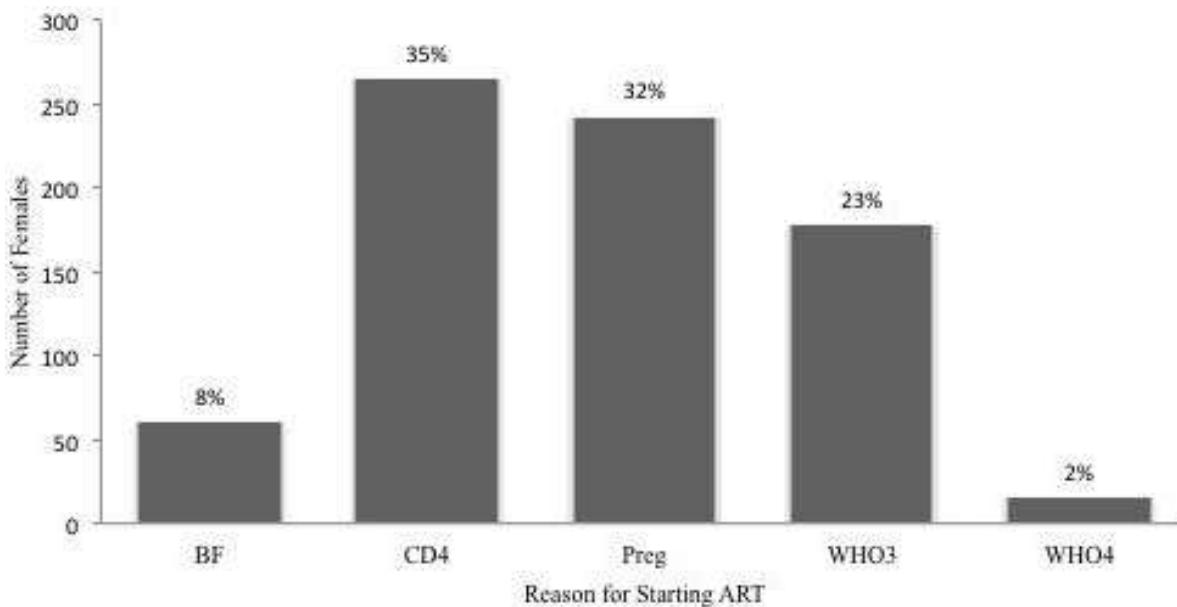


Figure 4. Reasons for starting ART among female HIV positive patients. BF = Breastfeeding; CD4 = CD4 count; Preg = Pregnant; WHO3 = WHO Clinical Stage 3; WHO4 = WHO Clinical stage 4.

tests positive for HIV starts treatment immediately regardless of CD4 count (WHO Progress Report, 2016). The main reason for starting ART for females in particular was a low CD4 count seconded by HIV in pregnancy, Figure 4. More women started ART because of pregnancy as part of prevention of mother to child transmission of HIV (PMTCT) option B+, since it is much more likely for African mothers to experience MTCT (Drake et al., 2014). HIV was common among farmers and business owners (38.5 and 24.5%, respectively),

Figure 6. This finding was expected, as most of the population of Kasungu district is made up of commercial farmers and business people who engage in promiscuous sexual behaviours that lead to higher HIV prevalence. Stigma has been described as a dynamic process of devaluation that significantly discredits an individual in the eyes of others. HIV-related stigma is multi-layered building upon and reinforcing negative connotations through the association of HIV and AIDS with already marginalized behaviours, such as sex work,

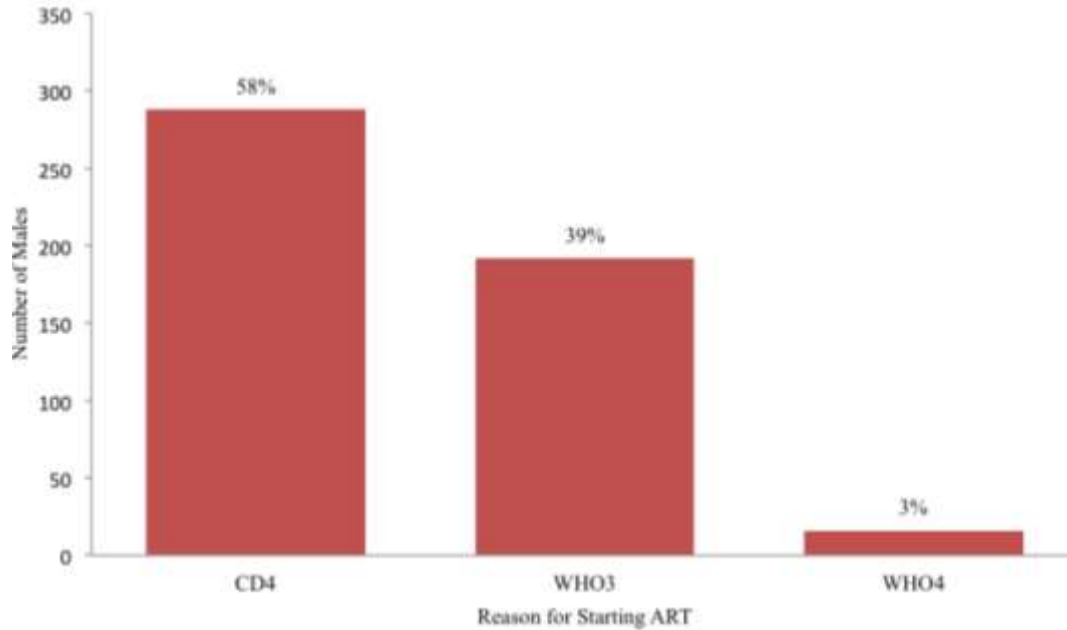


Figure 5. Reasons for starting ART among male HIV positive patients.

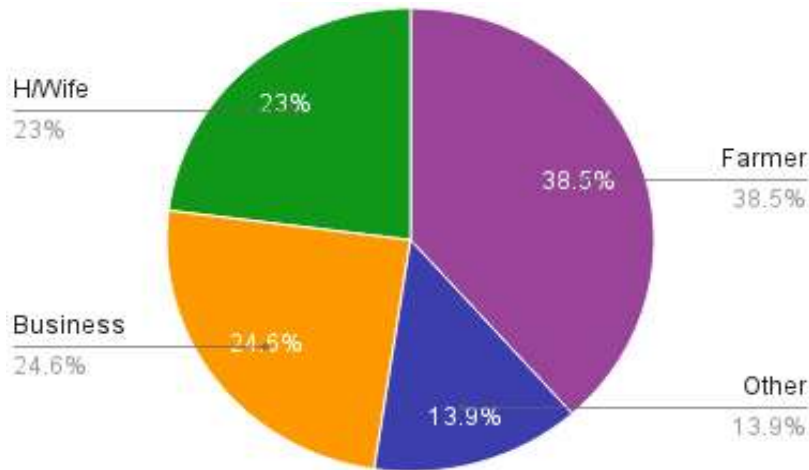


Figure 6. Occupations of HIV positive patients in Kasungu, 2014-2016.

drug use, and homosexuality and being transgender. Discrimination consists of actions or omissions that are derived from stigma and directed towards those individuals who are stigmatized. Both stigma and discrimination often have negative consequences on the lives of those living with HIV, and can promote risky behaviours due to fear of judgement (Valdiserri et al., 2002; Dos Santos et al., 2014, Reimers et al., 2016).

Our survey results indicate that internalized stigma and discrimination related to HIV-status is still prevalent in Kasungu, despite the fact that many people receive information about HIV/AIDS before they get tested, via

the hospital staff. The exact source of this stigma and discrimination are still unknown, but due to the confidential nature of HIV-status in Kasungu, patients may have experienced discrimination from family members, friends, or hospital staff. It is not uncommon for discrimination towards HIV-positive patients to manifest in the form of unprofessional treatment and care (Valdiserri et al., 2002).

This is consistent with the findings of Peter Aggleton et al in April 2005, which revealed that people living with HIV and their caregivers reported receiving differential and discriminatory treatment from health-care workers.

Discrimination lead to isolation in wards, early discharge from hospital, delays in surgery, and serious breaches of confidentiality—all effectively limiting access to proper care (Aggleton et al., 2005).

A little more than half of the surveyed patients had misconceptions about HIV before they were tested. This indicates that the general population of Kasungu is not very well educated about the details of HIV/AIDS, although information is available publicly through radio broadcasts and posters.

Conclusion

In Kasungu district, HIV is more common among females than males and HIV is common among young female population compared to young males. Between 2014 and 2016, many HIV positive clients in Kasungu started ART due to low CD4 count and WHO clinical stage 3. More farmers and business people in Kasungu district continue to suffer HIV disease than other occupations. Hence, interventions to prevent new infections should be implemented among most of the female population, farmers and business community in Kasungu district.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

ACKNOWLEDGEMENTS

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Full Length Research Paper

Predictors of HIV/AIDS preventive behavior among college students in Gambella town, Southwest Ethiopia using health belief model

Abraham Tamirat Gizaw^{1*}, Getachew Kiros Abreha¹, Tesfaye Legesse¹ and Hailemariam Hailesilassie²

¹Department of Health Education and Behavioral sciences, Institute of Health Sciences, Jimma University, Ethiopia.

²Department of Psychiatry, Institute of Health Sciences, Jimma University, Ethiopia.

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Safer sex behaviors (sexual abstinence, correct and consistent condom usage) are important for prevention of sexually transmitted diseases and HIV/AIDS among college students. The purpose of this article was to review studies addressing determinants of safer sex behaviors among college students. In Ethiopia little or no data existed on the preventive behaviors of HIV/AIDS among college students. Therefore, this study aimed to assess HIV/AIDS preventive behavior and associated factors among college students in Gambella town. An institution based cross-sectional study was conducted from 2nd to 4th March, 2015 using self-administered questioners. Pretest was conducted before the actual data collection and reliability test was performed. EPI DATA version 3.1 and SPSS version 21 software were used for data entry and analysis, respectively. Descriptive statistics were computed and a multivariate logistic regression model was fitted. P-value less than 0.05 were used to declare statistical significance. 670 college students participated in this study. The study identified that, 72.1% of the students had HIV/AIDS preventive behaviors. Among sexually active students, 83(30.6%) were using condom consistently in the last 12 month and 59.7% of the college students had no sexual intercourse. Being engaged in HIV/AIDS, preventive behavior was determined by age ≤ 19 years (AOR=1.89, 95% CI: 1.29, 2.77), good HIV related knowledge (AOR=2.48, 95% CI: 1.46, 4.09) and drinking alcohol (AOR=0.51, 95% CI: 0.35, 0.73). High perceived severity toward HIV/AIDS and high perceived benefit of engaging in HIV/AIDS preventive behavior (using of condom) also predicted HIV/AIDS preventive behavior (AOR=1.65, 95% CI: 1.12, 2.59) and (AOR=2.35, 95% CI: 1.36, 2.93), respectively. HIV/AIDS preventive behavior of college students in Gambella was high. However, inconsistent condom use among sexually active students was highly practiced. Age, knowledge of HIV/AIDS preventive behavior, alcohol use, perceived severity and benefit had a significant effect on HIV/AIDS preventive behavior of the college students.

Key words: HIV/AIDS, college students, health belief model.

INTRODUCTION

Globally, an estimated 36.7 million (34.0 million to 39.8 million) people live with HIV; or approximately 91% of adults aged 15 to 49 are living with HIV, 70% of it shared

by Sub-Saharan Africa with nearly 1 in every 20 adults (4.7%) living with the virus (UNAIDS, 2016, 2012). The human immunodeficiency virus type one (HIV-1), a

causal organism of acquired immunodeficiency syndrome (AIDS), destroys immune system thereby allowing any opportunistic infections leading to death of the patient. HIV-1 is known to be transmitted by the transfer of blood or blood products, semen, vaginal fluid, pre-ejaculated fluid, breast milk and using intravenous drug containing injections (Sharma, 2014).

In Ethiopia, the prevalence of HIV in adults is estimated to be 1.5% which represents 800,000 people living with the virus Ethiopia (FDR, 2014). In Gambella, one of the nine regional states of Ethiopia, the prevalence of HIV is four times higher than the national rate of 1.5% HIV/AIDS in Ethiopia, 2014). In this region, there are around 4359 people living with HIV, the annual incidence of new infection is 393; and annual deaths and orphans caused by HIV is 111 and 2179, respectively (Ethiopian Federal Ministry of Health, 2005).

Though typically well-informed about HIV overall, college students still have misconceptions about certain facts regarding transmission. Available studies among Ethiopian university students (young people), reported gap on HIV/AIDS preventive behaviors. For instance, 56.3% of Jimma University students involved in unprotected sex such as with casual partners and they failed to recognize that they were at risk of HIV infection, and 12% of them were sero positive (Belachew et al., 2004).

Similarly, a cross-sectional study done among Gondar University College of Medical Sciences students reported that 31(8.1%) of the students testified sexual contact with prostitutes and only about 20 (61.9%) of them used condom (Fitaw and Worku, 2002). Another cross-sectional study done among Madawalabu University students reported that from 160(42.3%) sexually active students, 81(56.2%) practiced unprotected sex; and 37(23.1%) students had lifetime multiple sexual partners. Besides, the study showed that 30(24.0%) of students had sex with commercial sex workers (Mengistu et al., 2013). Other study done among Haromaya University students showed that of the 41.2% sexually active respondents, 39(28.9%) of them reported multiple sexual partners (2 to 5 partners on average). In this study, 79(52.7%) of students had reported sex with commercial sex workers and 135 (75.4%) with casual friend (Dingeta et al., 2012).

Available evidence across the world documented conflicting findings related to predictors of HIV/AIDS preventive behaviors of youth. For instance, in studies conducted among Ghanaian (Adih and Alexander, 1999) and South African (Peltzer, 2000) University students, perceived susceptibility to HIV significantly predicted the consistent use of condom, but in others it is reported that

perceived susceptibility had no association with HIV preventive behaviors of consistent condom use, abstinence and being faithful to one sexual partner (Abraham et al., 1992; Holschneider, 2000). A study conducted among Japanese and Asian-American college students found perceived severity of HIV/AIDS as significantly predictor to their consistent use of HIV preventive behaviors (Iriyama et al., 2007).

On the contrary, one study, in Haiti, showed that 53% of youths, who perceived high barriers to condom use, were less likely to have consistently used a condom than those with low perceived barriers (Holschneider, 2000). Similar studies, conducted among South African (Peltzer, 2000) and Ghanaian (Adih and Alexander, 1999) university students, reported high students' perceived barrier was associated with the reduced intention to use condom. This high perceived barrier also significantly interacted with the student's perceived susceptibility and self-efficacy (Adih and Alexander, 1999). Besides, high self-efficacy of condom use was found to significantly predict past condom use and condom use intentions, and voluntary HIV counseling and testing among Tanzanian (Vermeer et al., 2009), Taiwanese (Lin et al., 2005), South African (Peltzer, 2000), and Ghanaian (Adih and Alexander, 1999) university students.

In Ethiopia, a cross sectional study conducted among 393 mining workers reported that 178 (45.3%) and 247 (62.8%) of them reported high perceived susceptibility and high perceived severity to HIV/AIDS, respectively (Abdissa et al., 2014). The study also showed that HIV preventive behavior was negatively associated with being in middle, higher and highest income and positively associated with completing secondary, tertiary school and self-efficacy. Another cross sectional study among Butajira high school, 658 students showed that perceived susceptibility, perceived barrier and perceived benefit predicted their voluntary counseling and testing behaviors (Abebe and Mitikie, 2009). This study was conducted with the aim of filling the gap by identifying predictors of HIV/AIDS preventive behaviors among college students of Gambella town using Health Belief Model.

Rationale to use health belief model

Health Belief Model (HBM) has been one of the most widely used conceptual frameworks in health behavior research, both to explain change and maintenance of health-related behaviors and as a guiding framework for health behavior interventions. It addresses the likelihood of taking recommended health action as influenced by specific health beliefs related to the health problem and

*Corresponding author. E-mail: abrishntamirat@gmail.com.

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recommended health actions. These beliefs are the individual's perceptions of the threat posed by a health problem (susceptibility, severity), the benefits of avoiding the threat, and factors influencing the decision to act (barriers, cues to action, and self-efficacy).

The core constructs of the model include; perceived susceptibility one's subjective perception of the risk of contracting a health condition, Perceived severity feelings concerning the seriousness of contracting an illness or leaving it untreated, Perceived benefits the believed effectiveness of strategies designed to reduce the threat of illness and risk, Perceived barriers feeling nuisance as someone who takes particular health actions or results from the actions, Cues to action events, either bodily or environmental, that motivate people to take action and Self-efficacy the belief of being able to successfully execute the behavior required to produce the desired outcomes.

In addition to the basic constructs, originators and researchers included some variables called modifying factors. These factors can influence individual perceptions and, indirectly, health related behaviors. These factors expected to modify the variances explained by the main HBM constructs. The variables which include under modifying factors are; demographic, socio-psychological, and structural (Glanz et al., 2008).

MATERIALS AND METHODS

Study design and setting

Facility based cross sectional study design was employed 2nd to 4th March, 2015 in Gambella town. Gambella town is the capital city of the Gambella regional state characterized by hot and humid climate. Around 51,660 inhabitants live in the city. Besides, the city consists of one health center and one health post, which are under the city's municipality, and 29 private health facilities. In Gambella city, there are five Colleges with 5412 regular students enrolled in the academic year 2015.

Study participants and sampling method

Among the available colleges of Gambella city, two colleges were selected by random sampling method. The study used single population formula to determine the sample size. By taking population proportion of 40%, which was taken from previous study finding on preventive behavior of HIV/AIDS in Gambella city among high school students (Mitike et al., 2005), and 10% non-response rate, the study final sample size was 714. This sample size was proportionally allocated to those selected college students.

Sampling frame was created by using student's registration books, which was taken from the two selected colleges' registrar office. By using computer generated simple random number table method, number of study participants from each department was determined. Finally, the 714 regular students were selected using simple random sampling technique.

Measurement

The study used an English version of self-administered

questionnaire, which was adopted from published literature related to the topic, and it was pre-tested on 10% of the study population. The questionnaire consisted of items related to knowledge of HIV/AIDS preventive behaviors (5 items).

Besides, it included items related to constructs of health belief model such as perceived susceptibility to HIV/AIDS (5 items), perceived severity of HIV/AIDS (6 items), perceived benefit from undertaking HIV/AIDS preventive methods (6 items), perceived barriers in undertaking HIV/AIDS preventive methods (7 items), and perceived self-efficacy to carry out HIV/AIDS preventive methods (7 items).

Mean score of HIV/AIDS related perceived susceptibility, perceived severity, perceived benefit, perceived barriers, and self-efficacy was obtained after summing the scores of respective items. The score below the mean score was taken as low and vice versa. On the other hand, respondents who retorted 3 or more correct answers are categorized as having good knowledge and below 3 as poor knowledge on HIV/AIDS preventive behaviors.

HIV/AIDS preventive behavior: was measured as, an individual abstaining from sexual intercourse in the last one year until the time of data collection or using condom consistently at each sexual intercourse in the last six months.

Statistical analysis

Data were analyzed, using Statistical Package for Social Sciences (SPSS version 21), to generate descriptive statistics such as means, standard deviation, frequencies, and percentages. For categorical variables, like sex, ethnicity, etc., proportions were computed.

Besides, variables related to perceptions of HIV/AIDS were categorized as high and low based on the mean scores that were computed from the sum scores. Those scores above the mean score were considered as high and vice versa. After creating dummy variables, multicollinearity was checked and the variance inflation factor was less than 10. Moreover, reliability test was performed for each constructs and Cronbach alpha ($\alpha > 0.7$). On the other hand, bivariate and multivariate logistic regression was used to identify factors predicting HIV/AIDS preventive behaviors regular college students. Those variables with p-value of ≤ 0.25 were entered to multivariate logistic regression model. P-value less than 0.05 were used to declare statistical significance. Final model fitness was assessed by Hosmer-Lemeshow goodness of fit test.

Ethical approval

This study obtained ethical clearance from institutional review board of Jimma University College of Health sciences. Co-operation letter was taken from Department Of Health Education And Behavioral Sciences. Permission letter was obtained from Gambella Administrations of the Regional Health and Education Bureau and other two selected colleges.

An information sheet was attached with each questionnaire to provide the study details and rights of the study participants. Written informed consent was obtained from the study participants. Data were kept anonymous and confidential during all stages of the study.

RESULTS

Background characteristics

Out of 714 students, 673 students participated in the

Table 1. Socio-demographic characteristics of the study participants.

Characteristics	Categories	Number	Percentage
Age	Less than 20 years	494	73.4
	20 years & above	179	26.6
Sex	Male	392	58.2
	Female	281	41.8
Religion	Orthodox	276	41.0
	Protestant	243	36.1
	Muslim	110	16.4
	Others	44	6.5
Ethnicity	Oromo	190	28.2
	Anuak	162	24.1
	Nuer	148	22.0
	Amhara	89	13.2
	Others	84	12.5
Monthly income (in Eth. Birr)	200 Eth. Birr or less	384	57.0
	Greater than 200 Eth. Birr	289	43.0
College	Dombosco T/V/E/T/College	370	55.0
	Openo T/V/E/T/College	303	45.0
Year of study	First year	225	33.4
	Second year	252	37.5
	Third year	196	29.1

Table 2. HIV/AIDS preventive behaviors of the study participants.

Engagement in HIV/AIDS Preventive Behavior	Numbers	Percentage
Totally abstained from sexual intercourse	402	59.7
Engages in sexual intercourse in the past 12 months period	271	40.3
Consistently used condom in all sexual intercourses in the past 12 months	83	30.6
Sometimes/ rarely used condom during sexual intercourses in the past 12 months	97	35.8
Did not used condom in all sexual intercourses in the past 12 months	91	33.6
Total	673	100

study with response rate of 94.3%. The respondents' age ranged from 18 to 28 years with mean age = 20 years \pm SD = 2.2 years. On the other hand, 58% of the total respondents were male. Furthermore, 99% of the participants were single.

In terms of religion, 41.0, 36.1 and 16.4% of the study students were orthodox, protestant and Muslim, respectively. By ethnicity, 28.2, 24.1, and 22.0% of the respondents were Oromo, Anuak and Nuer, respectively. On the other hand, average monthly income of the students was 287 Ethiopian Birr. Besides, 38, 33 and 29% of the participants were second, first and third year college students, respectively (Table 1).

Engagement in HIV preventive behavior

From the total of the study students, 59.7% of them had abstained from sexual intercourse. Out of the 40.3% students, who had sexual intercourse in the past 12 months, 30.6% of them had consistently used condom whereas the other 33.6% students did not use condom (Table 2).

Health belief model constructs of participants

43 and 61.9% of the college students had high-

Table 3. Health belief model use of the study participants towards HIV preventive behavior.

Perceptions toward HIV/AIDS	Categories	Number (n=673)	Percentage
Perceived susceptibility	High	289	42.9
	Low	384	57.1
Perceived severity	High	417	61.9
	Low	256	38.1
Perceived barrier	High	383	56.9
	Low	290	43.1
Perceived benefit	High	521	77.4
	Low	152	22.6
Perceived self-efficacy	High	409	60.8
	Low	264	39.2

perceived susceptibility and severity of HIV/AIDS, respectively. Besides, 77.4% of the college students had high-perceived benefit from exercising HIV/AIDS prevention methods. Similarly, 61% of students had high-perceived self-efficacy to undertake HIV/AIDS prevention methods by themselves. However, 57% respondents had high-perceived barrier to undertake HIV/AIDS prevention methods (Table 3).

Large number of students aged below 20 years old (78.1%) engaged in HIV preventive behaviors than those students with 20 years old and above. About 74.5% of students with ≤ 200 bimonthly income used HIV preventive behavior than those students with >200 birr monthly income. Compared to third year students, large proportions of first year students (74.2%) engaged in HIV preventive behavior. On the other hand, larger proportions of students with poor knowledge on HIV/AIDS (46.8%) were found not engaging in HIV preventive behaviors than those with good knowledge.

Besides, majority of the students (77.8%) who always drank alcohol did not engaged in HIV preventive behavior. However, larger proportion of students (85%) who always chewed khat had used HIV preventive behavior that is abstinence; stimulation due to khat kills their sexual interest. Though 66.8, 74.8, 75.4, 76.3, and 71% of the study students with high level of perceived susceptibility, perceived severity, perceived benefit, perceived self-efficacy, perceived barrier, respectively, use HIV/AIDS preventive behaviors engaged in HIV preventive behaviors while the remaining do not (Table 4).

Predictors of HIV/AIDS preventions

College student's age ≤ 19 years had 1.89 higher odds of HIV/AIDS preventive behavior as compared to those who

were ≥ 20 years (AOR=1.89, 95% CI: 1.29, 2.74). However, no other socio-demographic economic variables were found to be independently predictors of HIV preventive behavior of the study. On the other hand, college students with good HIV related knowledge had 2.48 higher odds of HIV/AIDS preventive behavior as compared to those poor HIV related knowledge (AOR=2.48, 95% CI: 1.46,4.09). College students who drank alcohol had 1.96 lower odds of HIV/AIDS preventive behavior as compared to those who did not drink alcohol (AOR=0.51, 95% CI: 0.35, 0.73).

College students who had high perceived severity of HIV/AIDS had 1.65 higher odds of HIV/AIDS preventive behavior as compared to those who had low perceived severity (AOR=1.65, 95% CI: 1.22, 2.59). Also, college students who had high perceived benefit had 2.35 higher odds of HIV/AIDS preventive behavior as compared to those who had low perceived benefit (AOR=2.35, 95% CI: 1.36,2.93). However, the other remaining health belief model constructs did not independently predict the HIV preventive behavior of the study college students in multivariate logistic regression analysis model (Table 5).

DISCUSSION

In Ethiopia, despite the college and university level students are among the vulnerable groups for HIV/AIDS infections, there is no representative behavioral data for college students. This study provides important information regarding the predictors of HIV/AIDS preventive behavior and associated factors among college students in Gambella town by using Health belief model.

This study revealed that 59.7% of the college students were abstained from sexual intercourse. In line to this study, a study done in Medawelabu University reported

Table 4. Engagement of students in HIV/AIDS preventive behaviors.

Independent Variables	Category	Engagement in HIV/AIDS Preventive Behavior			
		Engaged		Not engaged	
		Number	%	Number	%
Age	Less than 20 years	386	78.1	108	21.9
	20 years & above	99	55.3	80	44.7
Sex	Male	282	71.9	110	28.1
	Female	203	72.2	78	27.8
Ethnicity	Oromo	139	73.2	51	26.8
	Anuak	124	76.5	66	23.5
	Nuer	103	69.6	45	30.4
	Amhara	65	73.0	24	27.0
	Others	54	64.3	30	35.7
Religion	Orthodox Christian	196	71.0	80	29.0
	Protestant	178	73.2	65	26.8
	Muslim	81	73.6	29	26.4
	Others	30	68.2	14	31.8
Monthly income (<i>in Eth. Birr</i>)	≤200 Eth. Birr	286	74.5	98	25.5
	>200 Eth. Birr	199	68.9	90	31.1
Year of study	1 st year	167	74.2	58	25.8
	2 nd year	183	72.6	69	27.4
	3 rd year	135	68.9	61	31.1
Knowledge on HIV/AIDS	Good	444	74.5	152	25.5
	Poor	41	53.2	36	46.8
Drinking Alcohol	Always	2	22.2	7	77.8
	Occasionally	176	57.5	130	42.5
	Rarely	60	63.8	34	36.2
	Do not consume	247	93.6	17	6.4
Khat chewing	Always	18	85.7	3	14.3
	Occasionally	103	67.8	49	32.2
	Rarely	96	82.8	20	17.2
	Do not chew 'Khat'	268	69.8	116	30.2
Perceived susceptibility to HIV/AIDS	High	193	66.8	96	33.1
	Low	292	76.0	92	24.0
Perceived severity of HIV/AIDS	High	312	74.8	105	25.2
	Low	173	67.6	83	32.4
Perceived benefit of HIV/AIDS preventive behaviors	High	393	75.4	128	24.5
	Low	92	60.5	60	39.5
Perceived barrier to HIV/AIDS prevention behaviors	High	272	71.0	111	29.0
	Low	213	73.4	77	26.6
Self- efficacy to HIV/AIDS prevention behaviors	High	312	76.3	97	23.7
	Low	173	65.5	91	34.5

Table 5. Logistic Regression analysis result on factors predicting HIV/AIDS preventive behavior of the study participants.

Predictors	Category	Regression			
		Univariate		Multivariate	
		Crude OR	95% C.I.	Adjusted OR	95% C.I.
Age	<20 years	1.91****	1.32, 2.75	1.89	1.29,2.74
	20 years & above	1.00			
Sex	Male	1.02	0.72, 1.43		
	Female	1.00			
Ethnicity	Oromo	1.00			
	Anuak	1.43	0.86, 2.36		
	Nuer				
	Amhara	1.20	0.74, 1.94		
Religion	Orthodox Christian	1.00			
	Protestant	0.89	0.61, 1.32		
	Muslim	0.87	0.53, 1.44		
	Others	1.14	0.58, 2.27		
Monthly income (<i>in Eth. Birr</i>)	≤200 Birr	0.76	0.54, 1.06		
	> 200 Birr	1.00			
Year of study	First year	1.00			
	Second year	1.09	0.72, 1.63		
	Third year	1.30	0.85, 1.99		
knowledge on HIV/AIDS	Good	2.57****	1.54, 4.16	2.48	1.46,4.09
	Poor	1.00			
Drinking alcohol	Always/occasionally	0.66***	0.47, 0.94	0.51	0.35,0.73
	Rarely	0.87	0.55, 1.47		
	Never	1.00			
Chewing Khat use	Always	1.20	0.74, 2.21		
	Occasionally	0.92	0.57, 1.71		
	Rarely	1.18	0.66, 2.04		
	Never	1.00			
perceived susceptibility	High	1.58*	1.12, 2.22		
	Low	1.00			
Perceived severity	High	1.96****	1.36, 2.83	1.65	1.22,2.59
	Low	1.00			
Perceived benefit	High	2.47****	1.63, 3.73	2.35	1.36,2.93
	Low	1.00			
Perceived barrier	High	1.13	0.81, 1.59		
	Low	1.00			
Self-efficacy	High	0.73	0.46, 1.14		
	Low	1.00			

Significant p-value: (**** p<0.001; *** p<0.005; ** p<0.01; * p<0.05).

that, 58.7% of the students were abstained or had no sexual intercourse (Mengistu et al., 2013). However, 33.6% of the students, who had sexual intercourse in the past 12 months, didn't use condom; which is different from studies done among Jimma University, Madawalabu and Gondar University students (Belachew et al., 2004; Fitaw and Worku, 2002; Mengistu et al., 2013). This could be due to the difference in academic status. This study used college students who were in diploma level academic training whereas previous studies used university students, who were in degree or more level of academic training.

On the other hand, 43 and 61.9% of the study students had high-perceived susceptibility and severity of HIV/AIDS, respectively. This is similar to research findings done in Ethiopia among mining workers (Abdissa et al., 2014). The study showed that adolescent students were highly engaged in HIV/AIDS preventive behavior. Students aged <20 years had 1.89 higher odds of HIV/AIDS preventive behavior as compared to those aged 20 and greater. A study done in Midwest stated that African-American students greater than 20 years of age were less likely to use condom consistently (Adefuye et al., 2009). This indicates the need for effective education on HIV/AIDS preventive behaviors not only to adolescents but also to adults.

The study further revealed that, more than three-fourth of male and female students had knowledge of HIV/AIDS, meaning that they knew the three major methods for preventing HIV transmission. College students with a good knowledge of HIV/AIDS preventive behavior had 2.48 higher odds of HIV/AIDS preventive behavior as compared to those with poor HIV/AIDS preventive behavior related knowledge. This study has the same finding with a study done among Nigerian university students that, knowledge about HIV/AIDS was a positive predictor for preventive behavior (Arogundade and Faloores, 2012).

Among HIV/AIDS risk behaviors, alcohol use was negatively associated with HIV/AIDS preventive behavior. Students who drank alcohol had 1.96 lower odds of HIV/AIDS preventive behavior than those students who didn't drink alcohol. A study done in Jimma university stated that, alcohol users were about three times more likely to ever have unsafe sexual intercourse as compared to non-users (Tura et al., 2012). In this, perceived severity and perceived benefit were predictors of the students HIV/AIDS preventive behavior. College students who had high perceived severity of HIV/AIDS had 1.65 higher odds of HIV/AIDS preventive behavior as compared to those who had low perceived severity (AOR=1.65, 95% CI: 1.10,2.32). This discovery is supported by study done among mining workers and high school students, Ethiopia (Lin et al., 2005; Abdissa et al., 2014). On the other hand, college students who had high perceived benefit had 2.35 higher odds of HIV/AIDS preventive behavior as compared to those who had low

perceived benefit (AOR=2.35 CI: 95% (1.63,3.73). Likewise, this finding is supported by study done among mining workers and high school students, Ethiopia (Abdissa et al., 2014, Abebe and Mitikie, 2009).

The limitation of this study could be recall bias. That is participants might not accurately remember the time that they had sexual intercourse and the HIV preventive methods they used or not used. Besides, the study might be subjected to social desirability bias in a sense that all students know that, the society would prefer to use condoms or abstain from sex until a certain age. So, when they were asked whether they had engaged in such socially undesired behaviors, some might give the answers to the extent that Ethiopian society would prefer or accept.

However, despite the above doubted limitation, this study found that HIV/AIDS preventive behavior of college students was high. Consistent condom use among sexually active students was low.

Conclusion

Sex before marriage is high among the college students particularly among male students. This weighs up the possibility of rapid spreading of HIV infection. Age, knowledge of HIV/AIDS, alcohol use, perceived severity and benefit are the significant predictors of HIV/AIDS preventive behavior of the college students.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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