



THE IMPACT OF ALCOHOL USE ON HIV PREVENTION AND TREATMENT IN DISTRICT AND AREA HOSPITALS AT NELLORE

Dr. Mallikarjuna Rao

M.D, Assistant Professor, Department of Psychiatry, Govt General Hospital & College, Ongole, Andhrapradesh.

Dr. P. Viswanatha Reddy*

Clinical Psychologist, Department of Psychiatry, Narayana Medical College & Hospital, Chinthareddypalem, Nellore, Andhrapradesh. *Corresponding Author

ABSTRACT

Alcohol use disorders are common problems among persons with medical conditions and people living with HIV are no exception. Alcohol use disorders have been reported to be associated with poor adherence to antiretroviral medications and worse HIV-related outcomes. However, there are limited data on alcohol use disorders among people receiving treatment for HIV. The study assess the prevalence of alcohol use disorders and associated factors among people living with HIV attending services at District hospital, Nellore. This study was conducted using a facility-based, cross-sectional design. All people living with HIV who attended the ART clinic. A standardized questionnaire, the World Health Organization's Alcohol Use Disorders Identification Tool was used to measure probable hazardous, harmful and dependent use of alcohol ('alcohol use disorders'). Data were entered and analyzed using the Statistical Package for Social Science (SPSS version 16). Associations between alcohol use disorders and other variables were explored first by using binary logistic regression analyses. There was no significant difference in the prevalence of AUDs for person receiving ART and those who were ART naïve (32.6% and 38.6% respectively). An alcohol use disorder was found in 26.0% and 44.1% of females and males, respectively.

KEYWORDS :

INTRODUCTION:

Among people living with HIV, high alcohol consumption is associated with treatment nonadherence and poor immunological and viral outcomes [1, 2]. In addition, drinking alcohol is associated with physical and mental problems such as neuropathy pain, lipodystrophy, and depression. In Vietnam, alcohol consumption and alcohol use disorders (AUDs) have been found to negatively affect adherence to HIV medication and health-related quality of life (HRQOL) of patients with HIV/AIDS [3]. However, the relationship between alcohol use and higher HIV risk behaviors has not been studied. In many other settings, alcohol abuse and its relations to HIV transmission have been well documented. Heavy alcohol drinkers were more likely to engage in unsafe sexual behaviors, have multiple sex partners, or share syringes that increased the risk of HIV and other sexual transmitted infection (STI) transmissions.

Available literature suggests that the global burden of disease with regard to both alcohol and unsafe sex is considerable. For example, in 1990 alcohol accounted for 3.5% of the total disability-adjusted life years (DALYs) lost globally, and for 2.1% of the total years of life lost; unsafe sex accounted for 3.0% of the total years of life lost globally [4]. The respective contributions of alcohol and unsafe sex to the global burden of disease are, furthermore, amplified through the linkages that have been shown to exist between alcohol, risky sexual behaviour (unintended or unprotected sexual contact) and the spread of sexually transmitted infections (STIs), including HIV infection.

Sexual risk behaviour accounts for a large number of opportunities for acquiring HIV infection, and alcohol use has been shown to increase high-risk sexual behaviour. Moreover, the social dynamics that surround alcohol use, sexual risk behaviour and HIV infection and interactions between these issues warrant a search for alternative ways of dealing with the problem in diverse sociocultural settings, if intervention is to be effective [4]. Only by unravelling the social dynamics of alcohol use-related sexual risk behaviour within particular cultural settings can this be achieved. It can be anticipated that the body of knowledge acquired through proven scientifically sound instruments will not only highlight the relevant preventive measures to be adopted but will bring out relevant clinical and experimental research questions to be considered by all disciplines interested in curbing the problem of alcohol use-related sexual risk behaviour with regard to HIV infection.

Statement of the problem:

A negative population growth is generally evident in the countries in transition, but in India the population growth is high. Poverty, malnutrition and unemployment affect sub-Saharan Africa and India in particular. Gross economic disparity is evident in South Africa and the Russian Federation. In contrast to the other countries, India is still deeply rooted in its traditions, despite the influence of colonization and modernization. The countries differ in the degree to which urbanization has occurred. About half of the population in South Africa is urbanized. Most of the population in the Russian Federation, Belarus, Mexico and Romania reside in the urban areas, in contrast to India, Kenya and Zambia where most of the population reside in the rural areas. Overall, migration to urban areas is on the increase. This has led to demographic change and socio-economic imbalances. Post-colonial adjustment is evident in South Africa, Mexico and India. Change in the political and socioeconomic systems is marked in Romania, the Russian Federation and Belarus. Economic transition has led to increasing unemployment and social instability (e.g. criminal activity and family disintegration).

Literature review:

The word "alcohol" is derived from Arabic word "al-kuhul" and applied to many family of alcohol. Ethanol is the most famous and mostly used alcohol by human being for the purpose of Relaxing effect, enhancing sociability and for food complement. Because of its positive effect it is used by many people around the world which result in many complications. It is the common form of alcohol that referred as beverage alcohol which is used for drinking. Ancient people starts to use alcohol as early as 300B.C by preparing from material including fruits, berries, honey, corn, barley, wheat, sugarcane and potatoes [5].

Research carried out in several countries show that the consumption of alcoholic beverages before or during sexual acts tends to decrease the capacity to discern the risks associated with HIV infection. It also hinders the acquisition and use of condoms, which consequently increases the dissemination of HIV and other sexually transmitted diseases (STD) [6].

In Sub-Saharan Africa, which has the highest rate of HIV infection in the world, studies show that alcohol is the most common risk factor in contamination. This is due to unprotected sex being practiced frequently with different partners, and practiced for money – a fact

that is more frequent among men and women who consume alcohol before sex [7].

In Russia, sexual behavior associated with alcoholic consumption has shown to be the main factor of HIV dissemination. The new contamination rates are one of the highest in Europe, and are still increasing [8].

In India the transmission of HIV through heterosexual contact reaches 80% and the consumption of alcohol principally by men has been associated with the contamination of this virus [9].

In Brazil 89% of contaminations by HIV are through sexual contact. 16 Close to 95% of Brazilians who are over 18 years old are sexually active. Among them 29% of the women and 36.6% of the men use condoms during every sexual encounter. However, among the sexually active population, 33.9% of the women and 54% of the men regularly consume alcohol [10].

The variables of quantity and consumption habits associated with place, age, gender, psychiatric behavior, family structure, and socio-economic status are some of the factors discussed in the literature and present the consumption of alcohol as a risk factor in contracting an STD like HIV/AIDS. The pattern of consumption is still under discussion in reference to the relationship of alcohol and risky sexual behavior. Some studies show that people who drink heavily, frequently or not, have higher chances of getting involved in risky sexual behavior than those who show a different pattern of consumption [11].

Regardless of the drinking patterns, all studies show that there is an association between the consumption of alcoholic beverages and an increase in unprotected sex with multiple partners, with professional sex workers, sex practiced for money, and higher rates of STDs [7].

Alcohol use and HIV/AIDS: association and causal considerations

Alcohol use was found to be associated with HIV in recent systematic reviews and meta-analyses [12]. Three different explanations have been brought forward to explain the association: the impact of alcohol use on decision-making, resulting in riskier sexual behaviors (reviews of [13]); biological effects of alcohol use on HIV transmission and disease progression as overview; see also, including but not limited to effects of alcohol on treatment course and medication adherence [14]; and that most or all of the effects of alcohol on HIV incidence and disease progression can be explained by third variables, especially the effect of risk-taking and other personality variables.

To exclude the third explanation and corroborate the causality of the alcohol-HIV incidence via impacts on decision-making on safer sex practices, a number of experimental trials have been conducted, where alcohol use was experimentally manipulated as the main factor. Systematic reviews and meta-analysis of the results of these trials indicated a causal impact of alcohol use on decisions about unsafe sex practices, both when alcohol use was compared to placebo, or to intake of nonalcoholic beverages [15]. It should be noted that the underlying experiments have been conducted in different populations, including people living with HIV.

With respect to biological impacts, there seems to be clear evidence that heavy drinking or alcohol use disorders are associated with viral load increases and/or CD4 count declines, general weakening of the immune system, and more negative outcomes of antiretroviral therapy (ART), partly mediated by treatment adherence and partly by the pharmacological interactions of alcohol with ART and other medications to treat co-morbidities (for the association regarding adherence see above; for the other associations see for heavy drinking: for AUD: for mechanisms see [16]; for pharmacological interactions see. It should be noted, however, that delineation of causality in these biological pathways is difficult, as many factors

interact, and even when causality has potentially been established, it is hard to quantify the causal contribution of alcohol to HIV/AIDS disease progression based on biological mechanisms [14].

Impact of Alcohol Use Problems on people living with HIV :

Moderate and hazardous levels of alcohol use have been associated with non-adherence, late presentation to HIV/AIDS care and decline of CD4 in HIV infected persons, leading to faster disease progression and development of resistant strains of HIV [17]. Frequent alcohol use has also been associated with higher viral load. It also increases HIV risk behaviors, including having unprotected sex, multiple sex partners and high-risk injection behaviors. Additionally, alcohol-exacerbate liver toxicity, drug-drug interaction between alcohol and antiretroviral medications and the behavioral effects of alcohol on treatment adherence [18]. Any alcohol consumption decreased overall survival by more than 2 years if frequency of consumption was once per week or greater, and by 6.4 years with daily consumption. So, alcohol use is associated with worsen HIV treatment outcomes [19], and mortality because, excessive alcohol consumption may cause immune-suppression and impair the antioxidant system that protect liver during infection.

A study done in Johns Hopkins hospital on patient following ART [20] found that, both moderate and hazardous levels of alcohol use were associated with decreased antiretroviral adherence compared to no alcohol use [21].

Objectives:

To estimate the prevalence of alcohol use disorders among persons living with HIV To identify factors associated with alcohol use disorders among persons living with HIV

Hypotheses:

There is impact of use of alcohol on HIV and Treatment There is role of other factors which influence the treatment effectiveness

Sampling procedure:

The sample size was determined by assuming alcohol use disorder prevalence rate 50%, giving any particular out come to be with 5% margin of error and 95% confidence interval of certainty ($\alpha = 0.05$). Based on this assumption, the actual sample size for the study was computed using one-sample population proportion formula as indicated below.

RESULTS AND DISCUSSION:

A total of 401 participants were approached for enrolment in the study. Of these, 389 (97.0%) participants agreed to participate and around 12 (3.0%) participants refused. There were missing values for income (17 participants), CD4 count (one participant) and WHO stage (six participants). The majority (63.2%; n=246) of participants were female. The mean age of participants was $35.5 \pm SD 9.78$ years, ranging from 18 to 70 years. The largest proportion of participants were aged between 25 and 34 years, accounting for 44.7% (n=174) of the sample, followed by the 35 to 44 years age group which accounted for 30.0% (n=117) of participants. Out of the total participants involved in this study, 85.3% (n=332 participants) had been on ART and 14.7% (n=57) were on pre-ART follow-up.

Table 1: socio demographic variables of respondents

Variable	Character	Frequency (%)
Age	18-24	23(5.9)
	25-34	171(44.7)
	35-44	117(30.1)
Education	Secondary	172(44.2)
	Intermediate	102(26.2)
	Graduate	33(8.50)
Occupation	Unemployed	97(24.9)
	Daily laborer	99(25.4)
	Employed	55(14.1)

The internal consistency of AUDIT was calculated and it was within normal range (cronbach's $\alpha=79$). Nearly two thirds of participants (64%; n=249) reported that they had drunk alcohol at some point in their life. The remaining 36% (n=140) described themselves as abstainers. The overall prevalence of alcohol use disorder (defined as an AUDIT score ≥ 8) was 32.6% (n=127). Hazardous drinking, harmful drinking and alcohol dependence were found in 24.7% (n=96), 2.8% (n=11) and 5.1% (n=20) of the participants, respectively. Amongst patients who were taking ART, 31.6 % (n=105) were identified as having an alcohol use disorders and 24.7% (n=82) of those clients who were taking ART had hazardous drinking, 2.7 % (n=9) had harmful drinking and 4.2% (n=14) had probable alcohol dependence. The prevalence of AUPs in persons not on ART was 38.6% (n=22). AUPs were present in 26% (n=64) of females and 44.1% (n=63) of males. Males were more often identified to have hazardous alcohol drinking compared to females (30.1% (n=43) vs. 21.5% (n=53)). Males were also more likely to be dependent on alcohol than females (9.1 % (n=13) vs. 2.8 % (n=7)).

In participants who were categorized as having AUDs, 41.7% (n=53) said that they started drinking alcohol due to peer pressure, with 33.9% (n=43) initiating drinking because of easy availability of alcohol. Around 29.1% (n=37) of participants with AUDs reported that they started to drink alcohol due to parental modeling. Nearly 9% (n=11) of those patients with AUDs reported that they drank alcohol in order to increase their self-confidence. Only 6.3% (n=8) of those patients with AUDs reported that they drink to forget life stressors. Among participants with AUDs, 29.1% (n=37) reported a family history of alcoholism (see table 5). Using bivariate logistic regression, male gender was significantly associated with the presence of any alcohol use disorder (Odds Ratio (OR) 2.24, 95%CI=1.45 to 3.46, $P<0.001$). Participants who were Orthodox Christian in religion had 1.99 times increased odds of AUD compared to Muslims (95%CI: 1.20-3.29).

Table: 2 Factors associated with alcohol use problems among People living with HIV

variables	character	AUDS No (%)	NO AUDS No (%)	OR	95%CI	P-value
Gender	Male	63(44.1)	80(55.9)	2.24	1.45-3.46	<0.001
	Female	64(26.0)	182(74.0)			
Age	18-24	9(39.9)	14(60.9)			
	25-34	54(31.0)	120(69.0)	0.70	0.29-1.72	0.44
	25-44	43(36.8)	74(63.2)	0.90	0.36-2.26	0.83
Occupation	Unemployed	30(30.9)	67(69.1)	0.56	0.14-2.23	0.41
	Daily laborer	29(29.3)	70(70.7)	0.52	0.13-2.17	0.35
	Employed	17(30.9)	38(69.1)	0.56	0.13-2.35	0.43

Table: 3 Environmental and psychological factors for initiation of alcohol use problems among People living with HIV

variables	NO (%)
Easily Available of Alcohol	43(33.9)
Parental Modeling	37(29.1)
Peer Pressure to Drink	53(41.7)
Drink Alcohol to Increase Self-Confidence	11(8.7)
Drink to Forget Financial Difficulties	11(8.7)
Like the Way Alcohol Makes Me Feel Happy	29(22.8)

In this cross-sectional survey of alcohol use problems in persons with HIV/AIDS, nearly one third of AUP. The overall prevalence of AUPs (32.6%) defined by an AUDIT score ≥ 8 was more than the finding of community based studies Consistent with prior studies in

India, e.g., Tamil Nadu[22] and Mumbai, we found a relatively low prevalence of sexual risk behaviors of less than 5% among males in the general population. An innovative aspect of our study involved the examination of both behaviors that increase risk for men themselves (multiple partners) and for their partners (violence). When either of these behaviors was considered, at least 1 of 10 men and 1 of 4 male drinkers report HIV-related risk behaviors.

Recent research from Bangladesh and India documents that men who perpetrate violence against their wives are more likely to participate in extramarital sex and contract an STI compared to non-violent husbands [23, 24]. The mounting HIV epidemic among monogamous women in India highlights the importance of addressing their spouse's risk behaviors and gender in-equities, such as men's violence against women [25]. Gender relations that legitimize the subordination of women are critical factors in the spread and impact of the HIV epidemic, including through impairment of open communication regarding safe sex practices [26].

Hazardous alcohol use, identified by the AUDIT, was reported by 1 in 5 of all men and over 1 in 2 male drinkers. These findings are consistent with prior studies [22] that reported high rates of heavy alcohol use and alcohol-related problems in men and highlight alcohol misuse as a significant public health problem in Karnataka. Hazardous alcohol use was associated with men's HIV-risk related behaviors, even when controlling for other risk factors, such as demographics and other psychosocial factors, including social support and self-reported mental health. These findings are consistent with research from South Africa on hazardous alcohol use and higher rates of sexual risk behaviors, even when stressors, including interpersonal problems were accounted for[27]. A unique contribution of the present study's are findings that the severity of alcohol misuse plays a role in HIV-risk related behaviors, with possible alcohol dependence in particular, but not hazardous alcohol use without dependence, increasing risk for such behaviors Like hazardous alcohol use, the association of poorer mental health remained even when other risk factors for HIV risk behaviors in men was controlled for. An increasing body of research outside India, such as U.S. cohort studies that document depressive symptoms as independent predictors of HIV sero-conversion in men, shows those with poor mental health are at heightened risk of HIV infection [28]. Our study is the first to document the link between mental health ratings and HIV-related risk behavior in population data in India.

Fourteen percent of the global burden of disease is attributed to mental health disorders, including depression and other common mental disorders, alcohol and substance use disorders, and psychoses [29, 30]. Yet, the burden that mental health disorders represent is often underestimated due to the lack of appreciation of the inter-connectedness between mental illness and other health conditions [28]. This is reflected in the low priority placed on mental health in most low- and middle-income countries where mental disorders are addressed with separate services and budgets and viewed as creating additional, unaffordable costs [28]. World Health Organization data from across 60 countries substantiates the role of depression in poor health outcomes [31], demonstrating that depression results in greater decrements in health compared to chronic diseases and that co-morbid depression worsens health compared to depression or chronic disease alone, or any combination of chronic diseases without depression.

Our study adds to mounting evidence on the intertwining of mental health and physical health risk behaviors and urges the prioritization of poor mental health as an urgent public health issue in India. Researchers have also pointed out that even though 99% of HIV/ AIDS related deaths occur in low and middle income countries, there is almost no research on mental disorders and HIV from these countries [28]. Our findings suggest that men reporting both hazardous alcohol use and poorer mental health in the past year are at particularly elevated risk for HIV-related risk behaviors.

Diverse studies outside India suggest that mental health and other

psychosocial problems contribute to sexual risk behavior and HIV infection. Depression may play a role in fueling sexual risk behaviors on the internet [32], high psychological distress is associated with biologically confirmed STIs and sexual risk behaviors in female adolescents [33] but high self esteem increased sexual risk behaviors among Hispanic men who had sex with men [34]. These inconsistent findings suggest that an understanding of key components and processes of poor mental health that increase HIV risk behaviors is important for prevention and intervention efforts. For instance, the severity of depression could be important. While major depression reduces sexual activity, dysthymic disorder (a milder, persistent depressive disorder) increases likelihood of unprotected sex [35]. Similarly, isolation and loneliness may potentiate risky behaviors in black men who have sex with men, such as seeking sexual partners via the internet [36]. Poor mental health may also increase likelihood for risky behaviors due to perceptions of having few options to cope with distress and the "learned helplessness", characteristic of clinical anxiety and depression. Our mental health measure was limited to a single question on self-reported rating of mental health. Future studies on HIV risk behaviors in men should include more rigorous standardized assessments of mental health, including diagnostic measures and those of self-esteem, perceived loneliness, isolation, and risk-taking behavior

According to this study, factors associated with alcohol use disorders include male gender, smoking cigarettes and mental distress. Previous study done in different countries also found that male gender, smoking cigarettes[37] and common mental distress in male gender to be associated with alcohol use disorders which is consistent with this study. However, educational status, were not associated with alcohol use disorder which is not in agreement with previous studies done in different countries.

CONCLUSION:

The high prevalence of hazardous drinking found in this study highlights the need for brief intervention program in ART clinic. Also, this finding highlights alcohol dependence among clients that needs special attention (referring to specialist for diagnostic and treatment purpose) because, daily alcohol consumption decrease overall survival by more than six years according to previous study. Treatment of these disorders in the form of brief interventions or by referring to specialist can be successfully accomplished in the hospital settings. There was high prevalence of AUDs found among clients with mental distress which need further evaluation by mental health professionals.

REFERENCES:

- Hahn JA, Emenyonu NI, Fatch R, et al. Declining and rebounding unhealthy alcohol consumption during the first year of HIV care in rural Uganda, using phosphatidylethanol to augment self-report. *Addiction*. 2016;111(2):272-9.
- Neuman MG, Monteiro M, Rehm J. Drug interactions between psychoactive substances and antiretroviral therapy in individuals infected with human immunodeficiency and hepatitis viruses. *Substance use & misuse*. 2006; 41(10-12):1395-463.
- Kraemer KL. Can a behavioral alcohol intervention be delivered costeffectively to persons living with HIV/AIDS in sub-Saharan Africa? *Alcohol Clin Exp Res*. 2016;40(1):50-1.
- Murray CJL, Lopez AD. editors. (1996) The global burden of disease—a comprehensive assessment of mortality and disease, injuries and risk factors in 1990 and projected to 2020. Cambridge, Harvard University Press.
- Semple D, Smyth R, and Burns J (2005). *Oxford Handbook of Psychiatry*, 1st Edition Oxford University, chap 13 pp 496-500
- Stoner S, George WH, Peter LM, Norris J. Liquid courage: alcohol fosters risk sexual decision-making in individuals with sexual fears. *AIDS Behavior* 2007; 11:227-37.
- Weiser SD, Leiter K, Heisler M, McFarland W, Percy-de Korte F, DeMonner SM et al. A population-based study on alcohol and high-risk sexual behaviors in Botswana. *AIDS Care* 2006; 3:387-92.
- Joint United Nation Programme on HIV/AIDS – UnAids. *AIDS epidemic update, 2007*. Available at: www.unaids.org.
- Sivaram S, Srikrishnan AK, Latkin C, Iriondo-Perez J, Go VF, Solomon S et al. Male alcohol use and unprotected sex with non-regular partners: evidence from wine shops in Chennai, India. *Drug Alcohol Depend* 2008; 1(94):3:133-41.
- Abdo C. *Estudo da vida sexual do brasileiro*. São Paulo: Bregantini, 2006.
- Kalichman SC, Simbayi LC, Kaufman M, Cain D, Jooste S. Alcohol use and sexual risks for HIV/AIDS in sub-Saharan Africa: systematic review of empirical findings. *Prev Sci* 2007; 8(2):141-51.
- Schensul JJ, Singh SK, Gupta K, Bryant K, Verma R. Alcohol and HIV in India: a review of current research and intervention. *AIDS Behav*. 2010; 14 Suppl 1:51-7.
- Woolf SE, Maisto SA. Alcohol use and risk of HIV infection among men who have sex with men. *AIDS Behav*. 2009; 13:757-82.
- Kumar S, Jin M, Ande A, Sinha N, Silverstein PS, Kumar A. Alcohol consumption effect on antiretroviral therapy and HIV-1 pathogenesis: role of cytochrome P450 isozymes. *Expert Opin Drug Metab Toxicol*. 2012; 8:1363-75.
- Scott-Sheldon LA, Carey KB, Cunningham K, Johnson BT, Carey MP. Alcohol Use Predicts Sexual Decision-Making: A Systematic Review and Meta-Analysis of the Experimental Literature. *AIDS Behav*. 2015; 20 Suppl 1:519-539. doi:10.1007/s10461-015-1108-9.
- Neuman MG, Schneider M, Nanau RM, Parry C. Alcohol consumption, progression of disease and other comorbidities, and response to antiretroviral medication in people living with HIV. *AIDS Research & Treatment*. 2012; 2012:751827. doi:10.1155/2012/751827.
- WHO. The world health report; Global status report on alcohol and health, Geneva Switzerland 2011
- Samet J.H, Horton N.J, Traphagen E.T, Lyon S.M, and Freedberg K.A. Alcohol consumption and HIV disease progression: Are They Related? Alcoholism: clinical and experimental research, 2003; Vol. 27, No. 5, pp 862-867
- Achola J, Ghee A.E, Kihara A.N. High HIV prevalence, low condom use and gender differences in sexual behavior among patients with STD-related complaints at a Nairobi primary health care clinic. *International Journal of STD & AIDS* 1997; vol. 8, pp 506-514
- Martinez P, Andia I, Emenyonu N, et al. Alcohol use, depressive symptoms and the receipt of antiretroviral therapy in Southwest Uganda. *AIDS Behav*, 2008; Vol. 12, pp 605-612
- Hormes JM, Gerhardtstein K.R and Griffin P.T. Brief screening for alcohol use disorders in HIV primary care. A peer reviewed article, *HIV Clinician*, 2011; Vol. 23, No. 4, pp 8-13
- Gururaj, G.; Girish, N.; Benegal, VA. Alcohol Control Series 1: Burden and Socio-Economic impact of Alcohol: The Bangalore Study. World Health Organisation, Regional Office for South East Asia; New Delhi, India: [accessed 12/14/09]. 2006 http://203.90.70.117/PDS_DOCS/B0305.pdf
- Decker MR, Seage GR III, Hemenway D, Raj A, Saggurti N, Balaiah D, et al. Intimate partner violence functions as both a risk marker and a risk factor for women's HIV infection: findings from Indian husband-wife dyads. *Journal of Acquired Immune Deficiency Syndromes* 2009; 51(5):593-600. [PubMed: 19421070]
- Silverman JG, Decker MR, Kapur NA, Gupta J, Raj A. Violence against wives, sexual risk and sexually transmitted infection among Bangladeshi men. *Sexually Transmitted Infections* 2007; 83(3):211-215. [PubMed: 17301104]
- Krishnan S, Dunbar MS, Minnis AM, Medlin CA, Gerdtz CE, Padian NS. Poverty, gender inequities, and women's risk of human immunodeficiency virus/AIDS. *Annals of the New York Academy of Sciences* 2008; 1136:101-110. [PubMed: 17954681]
- Campbell JC, Batty ML, Ghandour RM, Stockman JK, Francisco L, Wagman J. The intersection of intimate partner violence against women and HIV/AIDS: a review. *International Journal for Consumer and Product Safety* 2008; 15(4):221-231
- Ammon Avalos L, Mertens JR, Ward CL, Flisher AJ, Bresick GF, Weisner CM. Stress, substance use and sexual risk behaviors among primary care patients in Cape Town, South Africa. *AIDS and Behavior* 2010; 14(2):359-370. [PubMed: 19205865]
- Prince M, Patel V, Saxena S, Maj M, Maselko J, Phillips MR, et al. No health without mental health. *The Lancet* 2007; 370(9590):859-877.
- Murray, C.J.L.; Lopez, A. *The Global Burden of Disease: A comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020*. Harvard School of Public Health on behalf of the World Health Organization and the World Bank; Boston, MA: 1996.
- Lopez, A.D.; Mathers, C.D.; Ezzati, M.; Jamison, D.T.; Murray, C.J.L. *Global Burden of Disease and Risk Factors*. Oxford University Press & The World Bank; Washington, DC: 2006.
- Moussavi S, Chatterji S, Verdes E, Tandon A, Patel V, Ustun B. Depression, chronic diseases, and decrements in health: results from the World Health Surveys. *The Lancet* 2007; 370(9590):851-858
- Kalichman SC, Cherry C, Cain D, Pope H, Kalichman M. Psychosocial and behavioral correlates of seeking sex partners on the Internet among HIV-positive men. *Annals of Behavioral Medicine* 2005; 30(3):243-250. [PubMed: 16336075]
- Seth P, Rajji PT, DiClemente RJ, Wingood GM, Rose E. Psychological distress as a correlate of a biologically confirmed STI, risky sexual practices, self-efficacy and communication with male sex partners in African-American female adolescents. *Psychology, Health and Medicine* 2009; 14(3):291-300.
- DeSantis JP, Colin JM, Provenico Vasquez E, McCain GC. The relationship of depressive symptoms, self-esteem, and sexual behaviors in a predominantly Hispanic sample of men who have sex with men. *American Journal of Men's Health* 2008; 2(4):314-321. [PubMed: 19477795]
- Rogers G, Curry M, Oddy J, Pratt N, Beilby J, Wilkinson D. Depressive disorders and unprotected casual anal sex among Australian homosexual active men in primary care. *HIV Medicine* 2003; 4(3):271-275. [PubMed: 12859327]
- Reisner SL, Mimiaga MJ, Skeer M, Bright D, Cranston K, Isenberg D, et al. Clinically significant depressive symptoms as a risk factor for HIV infection among black MSM in Massachusetts. *AIDS and Behavior* 2009; 13(4):798-810. [PubMed: 19462228]
- Pengpid S, Pelzer K and Van der Heever H. Prevalence of alcohol use and associated factors in urban Hospital outpatients in South Africa. *Int. J. Environ. Res. Public Health* 2011, Vol.8, pp 2629-2639.