

Full Length Research Paper

Does testing HIV negative encourage potentially dangerous beliefs? A study with young people in Botswana

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While it is assumed that HIV testing could contribute to the reduction of HIV infection rates, little if any research exists regarding whether HIV testing could inadvertently also contribute to the spread of HIV. The study explored whether the experience of testing HIV negative could result in people developing false beliefs about their capability of preventing HIV infection. The study investigated HIV testing and related beliefs among 347 students (18 to 21 years) enrolled at the University of Botswana. Analyses explored whether students who had tested for HIV infection differed in their HIV-related beliefs from students who had never gone for an HIV test. Compared to their counterparts, students who went for an HIV test were more likely to believe that they could trust their dating partner enough not to use a condom and that their dating partner was HIV negative too, even when their partner had not gone for an HIV test; and they were less likely to fear that they could contract HIV from a sexual relationship. The results indicate that the experience of having received an HIV negative test result made students believe that they were in control of HIV, which made them more vulnerable to HIV infection.

Key words: Adolescence, Botswana, cognitive development, dating, distorted beliefs, HIV/AIDS, HIV testing, sexual risk behaviour, self-deception, trust in relationships.

INTRODUCTION

Strategies to reduce HIV infection rates among adolescents have targeted sexual behaviour and appealed to young people to abstain from sexual intercourse for as long as possible, to stick to one partner only and to use condoms consistently (Van Dyk, 2005). Another strategy to combat the spread of HIV has been to encourage young people to test for HIV infection (Kaye, 2009). In Botswana, for example, HIV testing and counselling are regarded as key components in the prevention of HIV infection (NACA, 2003; Weiser et al., 2006) and young people, in particular, are encouraged to go for an HIV test and together with their partners. Relevant adverts market partner testing as an expression of love and care. It is assumed that the testing and counselling experience would make people more aware of the dangers of HIV and stop them from engaging in sexual risk behaviours (Jackson, 2002). While some studies seem to support such assumptions (Collins et al., 2001; Peltzer et al., 2004), other studies show that HIV testing does not

necessarily stop people from risk behaviours (Coleman et al., 2007). For example, a South African study by Olley et al. (2005) found that more than half of their HIV positive sample continued having unprotected sex after they learned about their HIV status. People of all age groups are also encouraged to test for HIV so that HIV positive people could be provided with anti-retroviral treatment (Kippax, 2006). However, research shows that not everyone in need adheres to the anti-retroviral medication (Becker et al., 2002; Hosek et al., 2005; Weiser et al., 2003; Rao et al., 2007). Thus, the efforts made by HIV testing programmes are not entirely successful. Most people at risk of contracting HIV are not willing to test, even when HIV testing facilities are easily accessible as is the case in Botswana (Peckham and Edwards, 2003; Weiser et al., 2006). For example, only 52.7% of a representative sample of young people aged between 12 and 22 years in Botswana were willing to go for an HIV test; and those who were sexually active were the least willing

to test (Fako, 2006). Similarly, a study of young people's attitudes towards HIV testing in South Africa found that only one fifth of their sample was willing to test (Peltzer et al., 2004). HIV testing can be a highly stressful experience as it causes many fears and anxieties (Kippax, 2006). Psycho-social studies on factors that predict willingness and unwillingness to test for HIV show that sexual activity, multiple sexual partners, lack of emotional support and fears of stigmatization are main barriers to testing for HIV (Fako, 2006; Maguen et al., 2000; Weiser et al., 2006).

While it is assumed that HIV testing could contribute to the reduction of HIV infection rates, little if any research exists regarding whether HIV testing could inadvertently also contribute to the spread of HIV. The experience of an HIV test could result in people developing false beliefs about their HIV vulnerability, particularly when their test result is negative. More specifically, people receiving a negative test result might not just feel relieved but also start believing that they are safe and capable of preventing HIV infection. People who tested HIV negative once might feel comfortable in their HIV negative status, they might not see a need to test again at some later stage, and they might also not see a need for precautions to prevent HIV infection in future. Such assumptions are supported by a study by Otten et al. (1993) with people who had tested for gonorrhoea, which found that the rate of gonorrhoea infection increased by 106% within a period of six months among those people who had a negative test result while it decreased by 29% among those with a positive result. While gonorrhoea can be healed, HIV infection cannot, which makes the study of potentially dangerous beliefs and misguided comfort resulting from a negative HIV test result important. People might perceive their sexual partner as HIV negative, simply because he/she once went for a test, even when the test was carried out long ago. People who perceive themselves and their partners as safe and as capable of preventing HIV infection have been found to be more prone to risky behaviour (Vanable et al., 2000).

This study aimed to explore possible counterproductive effects of risky beliefs that emanate from testing HIV negative. Instead of focusing on sexual risk behaviour, this study addresses potentially dangerous beliefs that could be associated with the experience of having tested HIV negative and that could lead people to engage in risk behaviours. The study-targeted students in late adolescence (18 to 21 years) enrolled at the University of Botswana. The conceptual framework for the study was cognitive development in adolescence.

In adolescence, the young person reaches his/her highest level of cognitive growth (abstract thinking), which however does not mean that adolescents always think and behave in a rational manner (Kaplan, 2004). Young adolescents are still in the process of identity formation (Erikson, 1968) and are, therefore, primarily concerned

with themselves, which is labelled as "adolescent egocentrism" (Elkind, 1967). They are highly self-conscious and believe that people would constantly pay attention to them and their appearance. They perceive themselves as absolutely unique and special and believe that they are invincible (Coleman and Hagell, 2007; Kaplan, 2004). For example, adolescents might not see the need to use condoms because they are convinced that while HIV infection happens to other people, it cannot happen to them. Adolescents may very well understand the risks involved in their behaviours (Coleman and Hagell, 2007), but they tend to ignore the risks when the immediate benefits of their behaviours are highly attractive. For example, the desire for being someone's girlfriend/boyfriend, even if this means having unprotected sex with him/her, might be much stronger than the fear of HIV infection. While this might sound nonsensical to an outsider, the adolescent concerned will rely on the belief "it won't happen to me". In addition, adolescents are likely to also believe that the person to whom they are attracted to cannot have HIV (Sanderson, 2004). Their beliefs make young people prone to engage in risk taking behaviour. Adolescent risk taking is also linked to adolescents' needs for self-expression and sensation seeking (Arnett, 1992). Sensation seeking is highest during adolescence, reaching its peak in late adolescence and the early twenties, and makes young people prone to engage in physical, social, financial and legal risks (Kaplan, 2004; Zuckerman, 1994). It is important to understand how cognitive development contributes to adolescent behaviour that appears to be irrational and irresponsible to an adult but not to the adolescent concerned. In late adolescence, self-consciousness declines and late teens begin "to realize that people are not as interested in them as they thought" (Kaplan, 1998, p. 274); they also realize that others may not react to them in the manner they thought they would. However, adolescents' beliefs about their uniqueness and invincibility decline at a much slower rate and can still be found among adults (Kaplan, 1998). Going for an HIV test and receiving an HIV negative test result might reinforce young people's beliefs about their invincibility.

METHODS

Owing to limited research about potentially dangerous beliefs associated with testing HIV negative, the nature of the study was explorative and descriptive. The study began with two non-directive focus group discussions with selected undergraduate students to probe into students' general views about dating in the era of HIV and AIDS. In a second step, and based on information obtained from the focus group discussions, a questionnaire was developed. Applying convenient sampling, the questionnaire was distributed among first-year students at the University of Botswana who had enrolled in the course 'Introduction to Psychology'; this course had an enrolment of 690 students from various Faculties. Participation in the study was voluntary. In total, 560 questionnaires were

distributed, of which 406 questionnaires were returned (response rate: 73%). Only one respondent reported that she was HIV positive and owing to her matchless status, she was excluded from data analysis. A further 58 questionnaires were excluded from data analysis because they were either incomplete over large parts or were received from respondents who were older than 21 years. The final sample remained with 347 students ages 18 to 21 years.

The questionnaire explored students' background with regard to HIV testing, dating, and sexual activity. 'HIV-related risky beliefs' were operationalised through six questions measuring potentially dangerous beliefs with regard to the contraction of HIV (e.g. "Do you feel that it is one's fate to get HIV?"; "Do you feel that when there is trust in a relationship, one is safe from HIV?"). Respondents who were in a dating relationship at the time of the study were presented with an additional set of five questions pertaining to their partner (e.g. "Do you trust your current dating partner enough not to use a condom?"; "Have you recently felt that your current dating partner is not telling the truth about his/her HIV status?"). The questionnaire also contained two questions about risk behaviours for sexually active students ("Have you recently (in the past month) had unprotected sex?", "Are you using condoms during sexual intercourse?") and one additional risk behaviour question for respondents in a dating relationship ("Apart from your dating partner, do you have sexual intercourse with somebody else?"). Demographic background variables measured gender, age, rural/urban upbringing, parental level of education, year of study and discipline in which the student was enrolled.

Data were analysed using descriptive statistics as provided by SPSS version 16.0. Chi-square tests were carried out to explore whether respondents who went for an HIV test differed in their HIV-related beliefs from respondents who had not gone for an HIV test. Possible differences in potentially dangerous beliefs were also investigated with regard to sexual activity and dating. Statistical significance was tested using two-tailed p-value (5% level) and 95% confidence interval.

RESULTS

A majority of 242 students (69.7%) belonged to the age group 18 - 19 years and 105 (30.3%) to the age group 20 - 21 years; 204 (58.8%) were female, 200 (57.6%) grew up in an urban area, 143 (41.1%) had a mother with tertiary education and 145 (41.7%) a father with tertiary education. Most respondents (92.2%) were first-year students. The majority of the respondents (188; 54.2%) had never tested for HIV, 102 (29.4%) had gone for an HIV test once and 57 (16.4%) more than once.

In total, 204 (58.8%) respondents reported that they were in a dating relationship at the time of the study; the average length of this dating relationship was 10.7 months (median), ranging from 2 days to 6 years (as reported by the respondents); the average age of their dating partner was 20.0 years (median). Of the total sample, 172 (49.6%) respondents reported that they had had sexual intercourse, and of the 204 respondents in a dating relationship, 105 (51.4%) reported that they had sexual intercourse with their dating partner. The demographic background characteristics of the respondents did not result in any statistically significant difference with regard to HIV testing, sexual activity or being in a dating

relationship, except for gender. Compared to their male counterparts, female respondents were significantly more likely to have tested for HIV ($p=0.021$) and to be in a dating relationship ($p=0.013$). Compared to respondents who never went for an HIV test, those who had gone for a test (either once or more than once) were significantly more likely to have been sexually active ($p=0.000$), dating ($p=0.000$), and to have had sexual intercourse with their current dating partner ($p=0.001$). Compared to non-dating respondents, those in dating relationships were significantly more likely to have been sexually active ($p=0.000$).

Table 1 shows that the majority of the respondents (77.2%) reported that they were not afraid of dating because of HIV and AIDS, and 45.2% believed that they would not contract HIV when they engaged in a sexual relationship. Only 8.4% believed that it was one's fate to get HIV but 11.8% were not sure in this regard. 98 (28.2%) respondents believed that trust in a relationship could provide safety from HIV infection and 45 (13.0%) respondents were 'not sure'. Most respondents (78.1%) believed that they were capable of preventing an HIV infection.

Interestingly, although only 45.8% of the respondents had gone for an HIV test, 67.1% believed that they were HIV negative; 32.9% were not sure about their HIV status. Compared to their counterparts, respondents who had gone for a test were significantly less likely to fear that they could contract HIV once engaging in a sexual relationship; but they were also less likely to believe that it was their fate if they got infected with HIV (Table 1). Of the respondents who went for an HIV test, all but four believed that they were HIV negative while respondents who never went for an HIV test were significantly more likely to report that they were 'not sure' about their HIV status. Important to note is that sexually active and non-active respondents did not differ significantly in any of the HIV-related beliefs; neither did dating vs. non-dating result in any statistically significant differences with regard to HIV-related beliefs.

Table 2 presents the frequencies of potentially dangerous beliefs among respondents who were in a dating relationship and had sexual intercourse with their dating partner ($N = 105$). The majority (61.0%) of the respondents reported that they were not afraid of contracting HIV when having sex with their dating partner; and 36.2% believed that they could trust their partner enough not to use a condom. Respondents who had gone for an HIV test were significantly more likely to have such trust than respondents who had not tested. Most respondents (81.0%) believed that their partner was telling the truth about his/her HIV status and, again, respondents who went for an HIV test were significantly more likely to have such a belief. Most respondents (72.4%) believed that their partner would not be cheating on them and, therefore, not put them at the risk of HIV infection; HIV testing did not result in any statistically significant differences

Table 1. HIV-related fears, risky beliefs and HIV testing.

	Total		Went for an HIV test at least once (N = 159) %	Never went for an HIV test (N = 188) %	Pearson Chi-square
	N	%			
“Are you afraid of dating because of HIV/AIDS?”					
Yes	41	11.8	10.1	13.3	$\chi^2 = 0.872$ df = 2 p = 0.647
Not sure	38	11.0	11.3	10.6	
No	268	77.2	78.6	76.1	
“In general, do you fear that once you engage in a sexual relationship you could get HIV?”					
Yes	142	40.9	34.6	46.3	$\chi^2 = 6.879$ df = 2 p = 0.036
Not sure	48	13.8	15.1	12.7	
No	157	45.2	50.3	41.0	
“Do you feel that it is one’s fate to get HIV?”					
Yes	29	8.4	5.7	10.6	$\chi^2 = 6.003$ df = 2 p = 0.050
Not sure	41	11.8	8.8	14.4	
No	277	79.8	85.5	75.0	
“Do you feel that when there is trust in a relationship one is safe from HIV?”					
Yes	98	28.2	25.8	30.3	$\chi^2 = 2.917$ df = 2 p = 0.233
Not sure	45	13.0	10.7	14.9	
No	204	58.8	63.5	54.8	
“So far, have you felt capable of preventing HIV infection?”					
Yes	271	78.1	79.2	77.1	$\chi^2 = 0.249$ df = 2 p = 0.883
Not sure	43	12.4	11.9	12.8	
No	33	9.5	8.9	10.1	
“Are you HIV positive?”					
Not sure	114	32.9	3.1	58.0	$\chi^2 = 14.943$ df = 1 p = 0.000
No	233	67.1	96.9	42.0	

regarding this belief. Interestingly, when asked about their dating partner’s HIV status, 76.2% of the respondents believed that their partner was HIV negative in spite of the fact that only 40 (38.0%) of the respondents reported that their partner had gone for an HIV test. Respondents who had tested for an HIV infection were significantly more likely to believe that their partner was HIV negative.

Table 3 shows frequencies of sexual risk behaviour. Of the sexually active respondents, 30.8% had unprotected sex during the past month of the study and 27.2% reported that they used condoms only ‘sometimes’; 4.2%

reported that they ‘never’ used condoms. Although not statistically significant at the 0.05 significance level, a statistical trend indicated that respondents who had gone for an HIV test were more likely to have had unprotected sex and to use condoms only sometimes than students who never went for a test. In addition to what is presented in Table 3, students in dating relationships were significantly more likely to have had unprotected sex ($p=0.000$) than students who were not dating. Of the sexually active respondents in a dating relationship (N = 129), more than a quarter reported that they ‘sometimes’ (19.4%) or ‘often’ (6.2%) had sexual intercourse with

Table 2. Risky beliefs among respondents who had sexual intercourse with their dating partner (N = 105) and HIV testing.

	Total		Went for an HIV test at least once (N = 70) %	Never went for an HIV test (N = 35) %	Pearson Chi-square
	N	%			
“Have you recently been afraid that you might get HIV when having sex with your current dating partner?”					
Yes	28	26.7	21.4	37.1	$\chi^2 = 3.635$ df = 2 p = 0.162
Not sure	13	12.3	11.4	14.3	
No	64	61.0	67.2	48.6	
“Do you trust your current dating partner enough not to use a condom?”					
Yes	38	36.2	44.3	20.0	$\chi^2 = 6.944$ df = 2 p = 0.031
Not sure	21	20.0	20.0	20.0	
No	46	43.8	35.7	60.0	
“Have you recently felt that your current dating partner is not telling the truth about his/her HIV status?”					
Yes	3	2.8	0	8.6	$\chi^2 = 8.435$ df = 2 p = 0.015
Not sure	17	16.2	12.9	22.8	
No	85	81.0	87.1	68.6	
“Have you recently been worried that your current dating partner might put you at the risk of HIV infection because he/she could be cheating on you?”					
Yes	17	16.2	12.9	22.9	$\chi^2 = 2.474$ df = 2 p = 0.290
Not sure	12	11.4	10.0	14.2	
No	76	72.4	77.1	62.9	
“Does your dating partner have HIV?”					
Yes	0	0	0	0	$\chi^2 = 17.745$ df = 1 p = 0.000
Not sure	25	23.8	11.4	48.6	
No	80	76.2	88.6	51.4	

somebody other than their dating partner, however, no statistically significant difference was found with regard to HIV testing (Table 3).

DISCUSSION

This study aimed to investigate whether young people in their late adolescence who tested HIV negative differed in their HIV-related beliefs from their counterparts who HIV. One of the potentially dangerous beliefs was with respect to their HIV status. The findings indicate that a considerable number of students simply believed that they and their partner had no HIV infection even though they had never gone for an HIV test. Such beliefs raise concern since people who perceive themselves and their partners

as not at risk of HIV infection are more likely to engage in sexual risk behaviour (Afifi, 1999; Vanable et al., 2000).

In this study, many of the respondents obviously understood that in order to prevent HIV infection, one cannot rely on trust in a relationship. However, such understanding seemed to have faded away when it came to their own relationships. Most of the dating students believed that their partner was telling the truth about his/her HIV status and that their partner would not put them at the risk of HIV infection by cheating on them. Although only a small proportion of the respondents in dating relationships (36.2%) trusted their partner enough not to use a condom, this is nevertheless a remarkable number.

While the partners of the respondents in this study might have deserved some trust in principle, the respon-

Table 3. Sexual risk behaviour and HIV testing.

	Total		Went for an HIV test at least once (%)	Never went for an HIV test (%)	Pearson Chi square
	N	%			
Sexually active respondents (N = 169)					
“Have you recently (in the past month) had unprotected sex?”					
Yes	52	30.8	36.5	23.3	$\chi^2 = 3.377$ df = 1 p = 0.066
No	117	69.2	63.5	76.7	
“Are you using condoms during sexual intercourse?”					
Always	116	68.6	62.8	76.0	$\chi^2 = 5.150$ df = 2 p = 0.076
Sometimes	46	27.2	34.0	18.7	
Never	7	4.2	3.2	5.3	
Sexually active and dating respondents (N = 129)					
“Apart from your current dating partner, do you have sexual intercourse with somebody else?”					
Often	8	6.2	6.4	5.9	$\chi^2 = 0.016$ df = 2 p = 0.992
Sometimes	25	19.4	19.2	19.6	
Never	96	74.4	74.4	74.5	

dents' beliefs about their partner's sexual behaviour and HIV status could turn out to have fatal consequences. Since HIV is not visible to the naked eye, people can never completely rule out that they themselves or their sexual partner might be HIV positive, even when they had at some point in their life tested for HIV infection. An HIV negative test result is only valid at the time when the test is carried out and partner testing is no guarantee for HIV safety since one can never be absolutely sure about one's partner's behaviour during his/her absence. In relationships, one's own and one's partner's HIV status become matters of beliefs and related trust. Research shows that the longer people stay in their relationships, the less they use condoms, be it because of an increase in mutual trust or because they fear that their partner could perceive them as promiscuous and lose trust in them if they insist in condom use (Afifi, 1999; Kalichman, 2000). Trust seems to drive people into a vicious circle that could have fatal consequences to them. In the era of HIV and AIDS, mutual trust in relationships is challenged, which makes relationships highly stressful if one does not find a way to maintain trust. Beliefs about one's partner, even distorted ones, can be a way to maintain trust in a relationship.

Distorted beliefs related to HIV and AIDS have been found to serve as mechanisms of self-defence (Maosa, 1996). Young people might even be more prone to such kind of self-defence. As mentioned before, adolescents

tend to believe in their own invincibility, and such belief still exists in late adolescence and even adulthood (Kaplan, 1998). Unfortunately, self-deceptive beliefs and mechanisms of self-defence are often neglected in the many HIV and AIDS discussions, in spite of the fact that beliefs, as wrong and distorted as they may be, contribute substantially to behaviour (Plattner, 2009).

In this study, most respondents believed that they were capable of preventing an HIV infection, which suggests that they felt in control of HIV. Probably, resulting from such perceived control most respondents believed that dating would not put them at the risk of an HIV infection. Since sexual intercourse is the main cause of HIV transmission and since dating relationships often lead to sexual intercourse (Pearce, 2007), one could have expected that more students would have been fearful about dating, in general, and a sexual relationship, in particular. However, such expectation might reflect adult reasoning but not necessarily adolescent assessment of the HIV situation. While many of the respondents in this study might indeed have been in control of HIV owing to their consistent condom use or by not having been sexually active yet, others might simply have believed that they were in control of HIV because of their perceived invincibility. A limitation of this study was due to not having probed more into the self-perceptions of the respondents; more in-depth research in this regard is needed.

Of particular interest are the results about HIV testing. Compared to students who never tested for HIV infection, those who did, were significantly more likely to believe that they were HIV negative and that their dating partner, too, was HIV negative, regardless of whether their partner went for an HIV test or not. Unfortunately, the study had not investigated when the respondents went for an HIV test, that is, whether before they engaged in sexual intercourse with their dating partner or afterwards. One could assume that they had tested for an HIV infection after they had sex with their dating partner and that owing to their own HIV negative test result, they had concluded that their partner was HIV negative too. More research about such assumption would be necessary.

Having received an HIV negative test result could have encouraged the respondents to trust their partner with regard to his/her HIV status. Compared to their counterparts, students who had gone for an HIV test were significantly more likely to believe that their partner would tell the truth about his/her HIV status and that they could trust their partner enough not to use a condom. Another important finding was that respondents who had gone for an HIV test were less likely to fear that they could contract HIV once they engaged in a sexual relationship than students who never went for an HIV test.

Overall, the findings about HIV testing, suggest that the experience of going for an HIV test that brought a negative test result made the students feel confident and in control of HIV. Although this study observed responses that reflected cautious sexual behaviour among most of the respondents, one cannot ignore the fact that almost a third of the sexually active respondents reported that they had unprotected sex during the past month of the study. In addition, a quarter of the dating students reported that they had 'often' or 'sometimes' sex with somebody other than their dating partner. A statistical trend indicated that respondents who went for an HIV test were more likely to have had unprotected sex and to using condoms only sometimes than respondents who never tested for HIV. Such findings are disturbing as they indicate that the experience of having received an HIV negative test result made the respondents actually vulnerable to HIV infection. More research is needed to explore how the experience of HIV testing influences adolescents' thinking and meaning making with regard to HIV and AIDS. Longitudinal research is required to determine how young people's HIV-related beliefs relate to their sexual behaviour over time.

Conclusion

Attending to young people's beliefs could help to understand why they put themselves and others at risk of HIV infection. With such understanding, HIV and AIDS prevention programmes could attempt to target potentially

dangerous beliefs of young people before they lead them to risk behaviour. However, potentially dangerous beliefs are not to be changed by simply telling adolescents that their thinking is wrong (Coleman and Hagell, 2007). Counselling services offered at HIV testing centres would have to play a particular role in targeting HIV-related beliefs among young people, not just when they are HIV positive but also when they receive an HIV negative test result. Instead of focusing primarily on sexual behaviour, counselling that respects young people in their way of meaning making could perhaps turn out to be more efficient in combating the HIV pandemic. Apart from youth-adequate counselling, sophisticated HIV prevention programmes are needed to reach out to young people's "assumptive worlds" (Janoff-Bulman, 1991) and thinking patterns. Adolescents themselves would probably be the best consultants when attempting to develop youth tailored HIV prevention programmes (Sherman and Bassett, 1999), since they are much more of experts in what appeals to current generations of youth than adults who emerged from their youth decades ago.

REFERENCES

- Afifi WA (1999). Harming the ones we love: relational attachment and perceived consequences as predictors of safe-sex behaviour. *J. Sex Res.* 36(2): 198-206.
- Arnett J (1992). Reckless behavior in adolescence: A developmental perspective. *Dev. Rev.* 12: 339-373.
- Becker SL, Dezii CM, Burtcel B, Kawabata H, Hoder S (2002). Young HIV-infected adults are at greater risk for medication non-adherence. *Medscape General Medicine*, p. 4.
- Coleman J, Hagell A (2007). *Adolescence, risk and resilience. Against the odds.* Chichester: Wiley.
- Coleman J, Hendry LB, Kloep M (2007). *Adolescence and health.* Chichester: Wiley.
- Collins RL, Kanouse DE, Gifford AL, Senterfitt JW, Schuster MA, McCaffrey DF, Shapiro MF, Wenger NS (2001). Changes in health-promoting behavior following diagnosis with HIV: Prevalence and correlates in a national probability sample. *Health Psychol.* 20: 351-360.
- Elkind D (1967). Egocentrism in adolescence. *Child Dev.* 38: 1025-1034.
- Erikson EH (1968). *Identity: Youth and crisis.* New York: Norton.
- Fako TT (2006). Social and psychological factors associated with willingness to test for HIV infection among young people in Botswana. *AIDS Care* 18(3): 201-207.
- Hosek S, Harper G, Domanico R (2005). Predictors of medication adherence among HIV-infected youth. *Psychol. Health Med.* 10: 166-179.
- Jackson H (2002). *AIDS Africa: Continent in crisis.* Harare: SAfAIDS.
- Janoff-Bulman R (1991). Understanding people in terms of their assumptive worlds. In D Ozer, JM Healy, AJ Stewart (Eds.), *Perspectives in personality: a research annual.* London: Jessica Kingsley. pp. 99-116
- Kalichman SC (2000). Couples with HIV/AIDS. In K.B. Schmalings, and T. Golman Sher (Eds.), *The psychology of couples and illness: Theory, research, and practice.* Washington, DC: American Psychological Association. pp. 171-190
- Kaplan PS (1998). *The human odyssey. Life-span development.* Pacific Grove: Brooks/Cole.
- Kaplan PS (2004). *Adolescence.* Boston: Houghton Mifflin.
- Kaye D (2009). Widespread HIV testing urged for U.S. teens. *Clinical Inf. Diseases*, 48: 4-6.

- Kippax S (2006). A public health dilemma: A testing question. *AIDS Care* 18: 230-235.
- Maosa E (1996). An investigation of self-deception mechanisms with regard to AIDS in Malawi. *J. Psychol. Afr.* 2: 51-63.
- Maguen S, Armistead, LP, Kalichman S (2000). Predictors of HIV antibody testing among gay, lesbian, and bisexual youth. *J. Adolesc. Health* 26: 252-257.
- NACA National AIDS Coordinating Agency (2003). Botswana National Strategic Framework for HIV/AIDS 2003-2009. Gaborone.
- Olley BO, Seedat S, Gxamza F, Reuter H, Stein DJ (2005). Determinants of unprotected sex among HIV-positive patients in South Africa. *AIDS Care* 17: 1-9.
- Otten MW, Zaidi AA, Wroten JE, Witte JJ, Peterman TA (1993). Changes in sexually transmitted disease rates after HIV testing and posttest counseling. *Am. J. Public Health* 83: 529-533.
- Pearce JJ (2007). Sex and risk. In J. Coleman, and A. Hagell (Eds.). *Adolescence, risk and resilience. Against the odds.* Chichester: Wiley. pp. 63-87.
- Peckham J, Edwards SK (2003). Facing the facts and identifying the barriers in HIV testing. *Sexually Trans. Inf.* 79: 21-29.
- Peltzer K, Nzewi E, Mohan K (2004). Attitudes towards HIV-antibody testing and people with AIDS among university students in India, South Africa and United States. *Indian J. Med. Sci.* 58: 95-108.
- Plattner IE (2009). Psychological challenges of HIV and AIDS: Why behaviour change is so difficult to achieve. In Fombad CM, Mupedziswa R, Maundeni T, Mookodi G (Eds.), *HIV and AIDS, vulnerable groups, human rights and development in Botswana* Cape Town: Made Plain, pp. 21-35.
- Rao D, Kekwaletswe TC, Hosek S, Martinez J, Rodriguez, F (2007). Stigma and social barriers to medication adherence with urban youth living with HIV. *AIDS Care* 19: 28-33.
- Sanderson CA (2004). *Health psychology.* USA: Wiley.
- Sherman JB, Bassett MT (1999). Adolescents and AIDS Prevention: A school-based approach in Zimbabwe. *Appl. Psychol. Int. Rev.* 48: 109-124.
- Vanable, PA, Ostrow DG, McKirnan DJ, Taywaditep KJ, Hope BA (2000). Impact of combination therapies on HIV risk perceptions and sexual risk among HIV-positive and HIV-negative gay and bisexual men. *Health Psychol.* 19: 134-145.
- Van Dyk A (2005). *HIV Aids care and counselling. A multidisciplinary approach.* Cape Town: Pearson.
- Weiser SD, Heisler M, Leiter K, Percy-de Korte F, Tlou S, DeMonner S, Phaladze N, Bangsberg DR, Iacopino V (2006). Routine HIV testing in Botswana: A population-based study on attitudes, practices, and human rights concerns. *PLoS Med.* 3: 1013-1022.
- Weiser S, Wolfe W, Bangsberg D, Thior I, Gilbert P, Makhema J, Kebaabetswe P, Dickenson D, Mompati K, Essex M, Marlink R (2003). Barriers to antiretroviral adherence for patients living with HIV infection and AIDS in Botswana. *Acquired Immune Deficiency Syndrome* 34: 281-288.
- Zuckerman M (1994). *Behavioral expressions and biosocial bases of sensation seeking.* Cambridge, UK: Cambridge University.