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THE EFFECTIVENESS OF HIGH LEVELS OF KNOWLEDGE REGARDING HIV/AIDS IN REDUCING DISCRIMINATORY ATTITUDES AND BEHAVIOUR TOWARDS HIV-INFECTED PEOPLE

M PIRIE
WJ COETSEE
jc@rau.ac.za
Department of Human Resource Management
University of Johannesburg

ABSTRACT

The primary objective of this study was to assess whether there is a relationship between increasing levels of knowledge about HIV/AIDS and perceptions of discriminatory attitudes and behaviour towards people with HIV/AIDS. Employees (3662) from a large accounting firm were exposed to a survey and a response rate of 41% or 1532 was received. The secondary objective of the study was to determine whether there were any statistically significant differences in the mean difference of knowledge scores of groups created in terms of the different biographical variables. ANOVA'S (to determine the significance of differences between the means), t-tests (two groups only) and F-statistics were used for the analysis. Given the large sample size an F-test is not conclusive and the effect of the difference in sample size needs to be taken into account. For this reason it was also necessary to look at the Partial Eta Squared. Results indicate that respondents are generally knowledgeable about the prevention and transmission of HIV/AIDS and that respondents' level of knowledge correlates negatively with discriminatory practices.

Key words
Knowledge levels regarding HIV/AIDS, discriminatory attitudes, HIV infected people

HIV/AIDS and its impact on South African Organisations

The HIV/AIDS pandemic threatens the welfare of between 4 to 6 million South Africans (Garbus, 2002), of which an estimated 4, 7 million people are between the age of 15–49 years (http://hivinsite.ucsf.edu). Furthermore, it is assumed that 25% of South Africa's economically-active individuals are believed to be HIV positive (Human Science Research Council, 2002; Pangaea Global AIDS Foundations HIV/AIDS Statistics, 2004). This implies that the HIV/AIDS pandemic has dramatically changed the environment in which organisations operate. As indicated in Figure 1, HIV/AIDS undeniably impacts on organisations and workplaces. Barrows, Gallow and Mulleady (1996) argue in this regard that the effect of HIV/AIDS manifests itself in the workplace through increased absenteeism, increased salaries, lower employee morale and higher staff turnover. HIV/AIDS also significantly impacts on organisational goals when investing resources in Black Economic Empowerment and upliftment programmes. Not only has the pandemic a significant impact on an organisation's profits through direct costs and declining economies, but the pandemic deters investment and decreases output which could earn foreign exchange (http://www.corporateleadershipcouncil.com). A study in several Southern and East African countries has estimated that the combined impact of AIDS-related absenteeism, decline in productivity, health care expenditures and recruitment and training expenses could cut profits by at least 6 – 8% and that absenteeism can account for as much as 25 – 54% of a company's total cost structure (Garbus, 2002).

Despite the mentioned economic challenges, HIV/AIDS-related stigmatisation, discrimination and denial have characterized the disease for the past twenty years and offered additional challenges for organizations in terms of prevention, care and treatment programmes (Lim & Loo, 2000). Linking to the previous, HIV/AIDS-related discrimination, stigmatisation and denial have been cited at all stages of the employment relationship (Connors & Heaven, 1995) and it can be argued that these impact negatively on the psycho-social contract between employer and employee. Regarding the psycho-social contract Veldsman (1996, p. 14) emphasises that the psycho-social contract focuses on the reciprocal expectations of co-responsibility for organizational success and serve as a source of security and legitimacy between the parties, providing stability and predictability to their interactions over time. It can therefore be argued that HIV/AIDS–related discrimination and stigmatization could destabilize the reciprocal expectations in the employee/employer relationship and could impact negatively on organisational effectiveness. HIV/AIDS discriminatory behaviour manifests itself in the workplace in different ways. Authors such as Aggleton, Whitty, Knight, Prayle, Warwick, and Rivers (1998) state in this regard that stereotyping, exclusion from social events, pre-employment HIV testing, denial of employment to people who test positive or who are suspected to be infected, dismissal, pressure to resign and harassment, employees' refusal to work with infected co-workers or refusal to share communal facilities, exclusion or denial of certain benefits and lack of confidentiality regarding an employee's health status could be regarded as examples of discriminatory practices.

Chandra, Deepthivarma and Manjula (2003) state in this regard that the internalization of these responses on an individual level may result in non-disclosure of HIV/AIDS status, self-exclusion from information, treatment and care programmes. This presents a major barrier to the effectiveness of educational programmes. Training is generally regarded as an important determinant in creating HIV/AIDS awareness and reducing risk behaviour (Jourdan & Etkind, 2004). However, training is expensive in terms of production and wages, and much investment in training is wasted because the training is not underpinned by effective models for behavioural change or by a learning environment (Holton & Baldwin, 2000). Relating to this, the present study seeks to determine if there is a relationship between increasing levels of knowledge about HIV/AIDS and perceptions of discriminatory behaviour toward people with HIV/IADS.

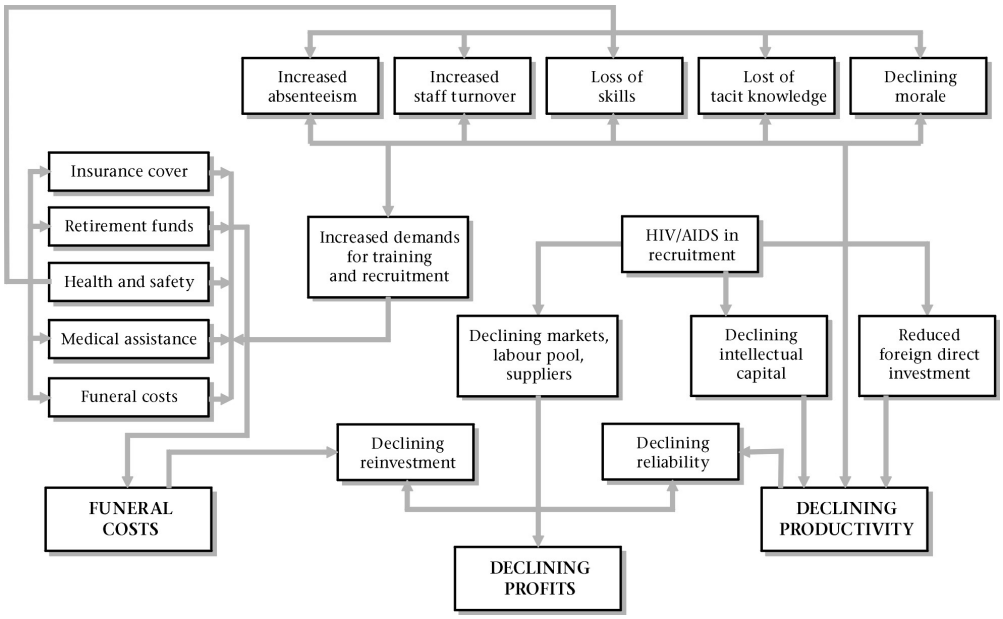

Figure 1: The impact of HIV/AIDS on organisations (UNAIDS, 200)

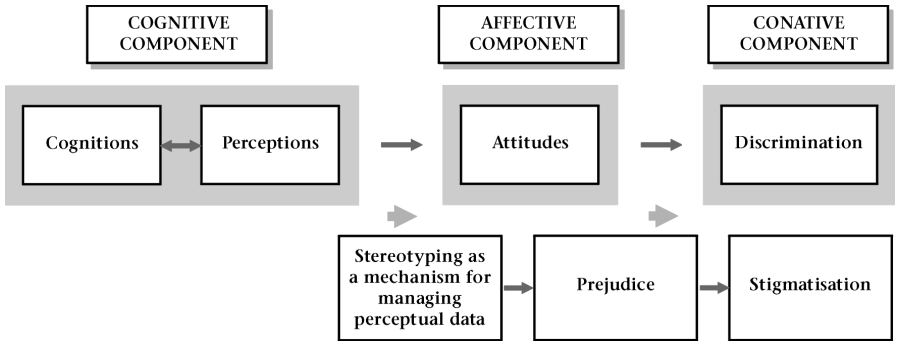

Figure 2: Relationship between cognitive, affective and conative components (Figure taken and adapted from Lewis, 1990)

HIV/AIDS-related Attitudes

Attitudes, has been variously defined as, stable predispositions (Cox & Cox, 1991) a general and enduring positive or negative feeling about some person, object, or issue (Arnold, Cooper & Robertson, 1995; Worchel, Cooper & Goethals, 1991) a mental state of readiness, learned and organized through experience (Ivancevich & Matteson, 1996) and consisting of three distinct components i.e.

1. Cognitive component (consists of a person's perceptions, opinions and beliefs);
2. Affective component (consists of the feelings, emotions a person has toward an object); and
3. Behavioural component (refers to the tendency of a person to act in a certain way).

The relationship between the three components is illustrated in Figure 2 and from this it is clear that the components are directly related and dependant upon each other (Lewis, 1990).

The creation of knowledge (i.e. cognitive component) can be understood as the cognitive activity that determines individual understanding and sense making of environmental stimuli. Weick (1995) and Dougherty, Borelli, Munir and O'Sullivan (2000) regard sense making as the process through which people reduce the complexity of their environment and by means of which different information, insight and ideas come together in a meaningful way. This means that information is gathered (through environmental scanning), interpreted and meaning is assigned to the information (Thomas & Pollock, 1999). Adding to this, Lewis (1990, p. 41) argues that, associated with cognition, is the concept of perception i.e. "...a cognitive process by which an individual gives meaning to the environment and it includes the interpretation of objects, symbols and people in the light of pertinent experiences" (Ivancevich et al., 1996, p. 121; Cook & Hunsaker, 2001). Dixon (1999) postulates that individuals create meaning structures (intentionally or unintentionally) when they are purposefully trying to understand or learn.

The new meaning structures may corroborate or modify existing meaning structures that the individual has, and when existing meaning structures conflict with new meaning structures, individuals experience an internal sense of uneasiness or dissonance. Closely related to perception is the concept of stereotypes. Stereotyping is the process employed to assist individuals in dealing with information processing demands. This means individuals make assumptions about people solely on the basis of their belonging to a certain race, group or gender (Hellriegel, Jackson & Slocum, 1999). Attitudes (as illustrated in Figure 2) originate from human cognitions and are closely linked and influenced by perceptions. Prejudice and stigmatisation normally refers to a specific attitude – a combination of hostile feelings, negative emotions and hostile behaviour towards others (Lewis, 1990; Ivancevich et al., 1996). Authors such as Goffman (1963), and

Parker and Aggleton (2002) describe stigmatisation as a significant discrediting attitude, a process of devaluation or a perceived flaw which allows for its bearer to be treated in a dehumanized way or to reduce the status of the person who possesses it, resulting in a "spoiled identity" (Parker et al. 2002). It is important to note that, apart from beliefs, perceptions and attitudes (which are critical for successful change (i.e. behaviour), there are individual difference variables (e.g. personality traits) that differentiate between individual responses to change (Schalk, Cambell & Freese, 1998; Weber & Weber, 2001). The last component illustrated in Figure 2 namely the *conative* component refers to the likelihood of an individual behaving in a certain way. Given the focus of the study, the term discrimination can be defined as the unfair and unjust treatment of an individual based on his/her real or perceived HIV status, and discrimination is usually seen to follow stigmatisation (UNAIDS, 2003).

Linking to the above, Dixon (1999) argues that individual actions are mediated by meaning structures. This means that stigmatisation and discriminatory behaviour is seen to be a function of the individual's current meaning structures. It can therefore be speculated that those who stigmatise do not understand the condition, lack a relevant frame of reference/meaning structure and that this is supported by inappropriate knowledge of the condition. It is further speculated that other variables that could impact on an individual's ability to construct or reconstruct meaning structures are demographic factors such as age, gender and educational level as well as perceived vulnerability to becoming infected (Norman & Carr, 2003). According to Chiliaoutakis et al. (1996) the initial characterization of AIDS as being the result of clandestine, immoral and antisocial behaviour as well as the stereotyping of 'high risk' groups on this basis, paves the way to a 'full blown' AIDS social epidemic of stigmatisation and discriminatory practices. It can therefore be argued that HIV/AIDS-related stigmatisation builds upon and reinforces prejudices that already exist and strengthen existing social inequalities. Attribution theory (Ferris, Bhawuk, Fedor & Judge, 1995; Cook et al. 2001) gives a further explanation of this phenomenon. Martinko (1995) argues in this regard that when an individual's behaviour is observed the observer attempts to determine whether the behaviour was *internally* caused by the individual or *externally* by the context or the situation. Three criteria namely *distinctiveness* (explain whether a person's behaviour fits with other behaviour), *consistency* (explain the degree of variance in behaviour over time) and *consensus* (how others behave in similar situations) are used in the attribution process (Cook et al., 2001). This means that society is likely to attribute the cause of HIV/AIDS infections to either internal or external factors and thereby feel that stigmatisation and discriminatory practices are justified. This also illustrates the fact that the behaviour of people is continuously influenced by perceptions and attributions. Figure 3 not only indicates the link between HIV/AIDS and pre-existing sources of stigmatisation and discrimination but also links to factors used in the attribution process.

Furthermore, it can be argued that by stereotyping certain individuals or groups, and through attribution, society can excuse itself from the responsibility of caring for and looking after infected populations. Stereotypes also enable people to justify to themselves why they personally will never be likely to become infected, which leads to a state of denial. Some of the most common forms of denial are to ignore the existence of HIV and AIDS, neglecting to respond to the needs of those infected and failing to recognize the growing epidemic in the belief that HIV/AIDS 'can never happen to us'. Denial fuels AIDS stigmatisation by making those individuals who are infected appear abnormal and exceptional (http://www.avert.org).

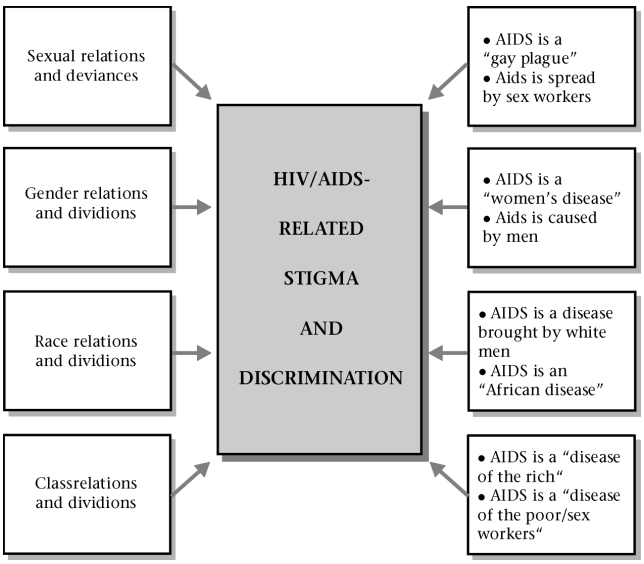

Figure 3: The link between HIV/AIDS and pre-existing sources of stigmatisation and discrimination (Figure taken from Horizons, 2004, p. 3)

HIV/AIDS knowledge and discriminatory behaviour

The majority of HIV/AIDS interventions have the common goal of educating employees regarding HIV/AIDS transmission and prevention so as to reduce the number of new infections, i.e. change individuals' at risk behaviour (Sixsmith, Kelleher & Crangle, 2000). Organisations therefore need to provide continuous and strategic HIV/AIDS awareness, education and prevention activities integrated into ongoing communication, education and training activities. Despite the importance of continuous HIV/AIDS education and preventative programmes, the impact and effectiveness of these programmes remain questionable (Grunseit & Aggleton, 1998).

From the literature it is clear that research conducted is inconclusive with regard to whether increases in knowledge alone is sufficient in changing discriminatory attitudes toward people infected with HIV/AIDS. Research conducted by Chiliaoutakis et al. (1996) showed that the higher the level of accurate knowledge about AIDS, the less discrimination and stigmatisation would occur. Unlike the findings of Chiliaoutakis et al. (1996), De Bruyn (1998) found that education will not change everyone's attitudes or prevent stigma and discrimination in every instance. Stigmatized attitudes toward people with HIV/AIDS persist in a minority of the general population and research has demonstrated that negative attitudes toward, for example, homosexuality contribute significantly to such stigmatizing attitudes. Quah (1998) found that the image of HIV/AIDS sufferers is moulded by a person's age and level of information (outcome of formal education and knowledge) on the disease. Ragan and Bowen (2001) found that the provision of information can improve negative attitudes however, the new attitude may be lost without reinforcement for change. Bhate (1999) adds another level of complexity to the debate by stating that when attempting to change attitudes, it is important to know which cognitive styles one is dealing with (adaptors versus innovators) as they follow different patterns in changing attitudes as a result of exposure to negative and positive sources.

Recent international and local research regarding HIV/AIDS knowledge showed that respondents who were younger and had a higher formal education attainment (de Bruyn, 1998; Garbus, 2002; Norman et al., 2003; Steward, 1993) lived in urban rather than rural areas; were employed and had higher household socioeconomic status (Garbus, 2002); had better HIV/AIDS knowledge. No significant gender differential regarding HIV/AIDS knowledge was found (Garbus, 2002).

With regard to denial and fear, Garbus (2002) found that only 0.5 percent of South Africans believed that there was someone infected with HIV in their families and that up to 92 percent of persons who tested positive for HIV were not able to tell their partners their serostatus. International research shows that stigma, fear of discrimination (http://www.avert.org; Chandra et al., 2003), disgrace to family and self (Lau, Tsui, Li, Chung, Chan & Molassiotis, 2003), were reported as the main reasons for non disclosure. The majority of subjects (73%) reported anticipation of negative societal reaction as the main concern following disclosure (Chandra et al., 2003).

The conviction of individuals that they will be discriminated against is confirmed by various studies that show that people would resist working alongside, avoid, or even dismiss an employee if the person was found to be HIV-positive (Barrows, Gallo & Mulleady, 1996; Lau et al., 2003). Results of a study conducted by Lim and Loo (1999) indicated that respondents view the employing of people with HIV/AIDS as holding adverse consequences for the organisation.

A number of studies have shown a positive correlation between perceived personal risk of contracting the disease and knowledge of the disease. The Kaiser Youth Survey undertaken in 2000 showed that 54% of respondents indicated that they are afraid they may contract HIV and that 66% agreed with the statement "I could die of AIDS" (Garbus, 2002). A study in Trinidad of 1 351 adults showed that knowledge was associated with concern about personal risk of HIV (Quah, 1998) and that the image of HIV/AIDS is less important than the joint impact of accepting personal responsibility and the perceived seriousness of the disease (Norman et al., 2003).

The finding is that research is inconclusive and lacking with regard to the link between the extent of HIV/AIDS knowledge, attitude towards infected and affected people and resulting behaviour (discriminating, indifferent or accepting). Although knowledge appears to be a very important variable in reducing stigma and discrimination, it is clearly not the only variable. Existing studies looking into the role that a supportive, protective and caring environment plays in reducing HIV/AIDS discrimination can also be expanded on. To date only a limited amount of research has examined working adults' attitudes towards infected colleagues in the workplace. It would appear that research in South Africa regarding mechanisms involved in the stigmatisation of risk behaviours, the socio-cultural construction of risk, attitudes of discrimination, and attitudes based on fear, have not received much scientific attention at all. The research that has been conducted on the last mentioned issues has also mainly been of international origin. Bearing in mind that cultural differences may influence people's attitudes (Quah, 1998) towards having to work with an HIV-infected colleague, a case can be made that it is worthwhile examining individuals' attitudinal and intended behavioral responses towards infected people in the organisational setting within the South African context. The problematic nature of stigmatisation and discrimination as social processes or phenomena are summarized by Parker et al. (2002, p14):

"Much of what has been written about stigma and discrimination in the context of HIV and AIDS has emphasised the complexity of these phenomena, and has attributed our inability to respond more effectively to both their complex nature and their high degree of diversity in different cultural settings".

Objectives of the study

The primary objective of the study was to determine if there is a relationship between increasing levels of knowledge about HIV/AIDS and perceptions of discriminatory attitudes and behaviour towards people with HIV/AIDS. The secondary objective of the study was to determine if there are any statistically significant differences in the mean difference scores between levels of knowledge with regard to educational qualifications, sex, age and high-risk behaviour. This comparison would assess whether different comparison groups have different mental models regarding positive HIV/ AIDS employees. The previously mentioned objectives have been implemented by utilizing exploratory means, including a questionnaire that was compiled with the aim of measuring knowledge levels of the respondents regarding HIV/AIDS. The research design is further explained and developed in the next section.

RESEARCH DESIGN

Research Methodology

This study is a quantitative study and a cross-sectional survey design was used to describe the information on the population collected. The study is also exploratory and descriptive as well as retrospective in nature (i.e. it was done on retrospective data). Elements of the research design are predetermined and in addition it is ex post facto and attempts to show causes and consequences after they have occurred.

Respondents

Due to the inherent educational value that knowledge, attitude, practices and behaviour (KAPB) surveys have, all 3662 employees of a large accounting firm situated in nine regions (See Table 1) were exposed to the survey.

TABLE 1
GEOGRAPHIC REGIONS

Region of work	Count	%
Eastern Cape	92	6,0%
Free State	72	4,7%
Gauteng	763	49,8%
Kwazulu Natal	136	8,9%
Limpopo	16	1,0%
Mpumalanga	20	1,3%
North West	36	2,4%
Northern Cape	43	2,8%
Western Cape	353	23,1%
Total	1531	100,0%

A response return rate of 41% (N = 1532) was achieved. Employees from offices situated in Gauteng, Kwa-Zulu, Free State, Western Cape, Northern Cape, North West, Mpumalanga, Limpopo participated in and responded to the survey. The employment setting was predominantly white collar and participants operated in diverse functional areas e.g. from professional staff such as accountants to support and administrative personnel.

Table 2 gives an indication of the ages of the respondents.

TABLE 2
AGE OF RESPONDENTS

Age	Count	%
19 and younger	8	0,5%
20 - 24	287	18,7%
25 - 29	496	32,4%
30 - 34	277	18,1%
35 - 39	150	9,8%
40 - 44	123	8,0%
45 - 49	80	5,2%
50 and older	110	7,2%
Total	1531	100,0%

Respondents ages ranged from as young as 19 (0,5%) to age 50 and older (7%) with the majority of employees (32%) in the 25 – 29 year age category (N = 496). The sample indicated a leaning towards female respondents (N = 902), with male respondents accounting for 41% of the sample (N = 627). The educational level of the sample varied between high school, college and university, with the majority of respondents (63%) reporting a university degree (N = 963). See Table 3 in this regard.

TABLE 3
EDUCATIONAL LEVELS

Highest educational level	Count	%
College/Technikon	267	17,4%
High school	284	18,5%
Primary school	17	1,1%
University	963	62,9%
Total	1531	100,0%

More than half of the respondents (52%) indicated that they were in a relationship with the remaining 48% indicating that they were single at the time.

Measuring Instrument
In the research, a questionnaire consisting of 32 items and comprising three sections was utilized. Section A recorded the demographic data of the various respondents. Section B (22 items) measured the level of knowledge of the respondents regarding HIV/AIDS and Section C (10 items) measured discriminatory practices regarding an HIV-positive individual. Various literature sources were used in the compilation of the questionnaire. In this regard the ILO Code of Practice on HIV/AIDS and research done by the World Health Organisation refer. Following the study of different knowledge domains, it appears that information regarding HIV/AIDS is centered around the following themes:
1. How is the virus contracted?
2. What is the cause of HIV/AIDS?
3. Employees concerns, myths and fears;
4. Prevention and control of the spread of the virus;
5. Testing for HIV/AIDS;
6. Discriminatory practices.

The abovementioned themes served as point of departure in formulating the questions. Each of the items in the HIV/AIDS Knowledge Questionnaire is presented in the form of a three-point scale namely *Agree*, *Uncertain*, and *Disagree*. This format is most appropriate, given the objective of the study, i.e. to assess the level of knowledge of the respondents. For the purpose of this study all questions answered as *Uncertain* were considered to be incorrect answers, which indicated a lack of knowledge. An example of the item construction is included.

"Do you believe HIV/AIDS can be cured?"

Agree	Uncertain	Disagree

"Do you believe that you can prevent becoming infected by wearing a condom during intercourse?"

Agree	Uncertain	Disagree

Procedure
A pre-survey distribution, meeting was held with the participating organisations stakeholders. The aim of the workshop was to familiarise stakeholders with the HIV/AIDS Knowledge Questionnaire content and with the procedures of distribution to ensure buy-in into the process, efficient survey delivery and minimizing possible misunderstandings.

Surveys were distributed amongst all of the participating organisations' employees. Although the majority of surveys were distributed electronically a small number of hard copies were distributed to employees who were not able to obtain them or did not have access to the electronic version.

Employees also received an email or letter from the Deputy Chief Executive Officer of the participating organisation that explained the objectives of the survey and encouraged participation. Employees were asked to either return the survey electronically or to place completed questionnaires in the collection boxes provided. Employees were assured that the data would be kept confidential and anonymous.

RESULTS

The secondary objective of the study was to determine whether there were any statistically significant differences in the mean difference of knowledge scores of groups created in terms of the different biographical variables. ANOVA'S (to determine the significance in difference between the means), t-tests (two groups only) and F-statistics were used for the analysis. Given the large sample size, an F-test is not conclusive and the effect of the difference in sample size needs to be taken into account. For this reason it was also necessary to utilize the Partial Eta Squared.

HIV/AIDS Knowledge Questionnaire
The items utilized in the questionnaire are indicated in Table 4. Given the purpose of the investigation, namely to determine the relationship between increasing levels of knowledge about HIV/AIDS and perceptions of discriminatory attitudes and behaviour towards people with HIV/AIDS, items were included that are considered by inspection to have face validity.

The pilot questionnaire can therefore serve as point of departure in compiling and refining a subsequent questionnaire. It is apparent from Table 4 that questions 1; 6; 7; 9; 11; 12; 15; 16 possess a relatively low discriminatory value and it is recommended that the items be excluded from any subsequent questionnaire.

TABLE 4
KNOWLEDGE QUESTIONS AND DISCRIMINATORY PRACTICES

SECTION B: KNOWLEDGE		Agree	Uncertain	Disagree
1. A blood test can show whether someone has HIV/AIDS	Count	1480	28	21
	%	96,8%	1,8%	1,4%
2. It is possible to have a negative HIV blood test in the first couple of months after becoming infected with HIV	Count	1251	178	94
	%	82,1%	11,7%	6,2%
3. An HIV-positive mother who is breast-feeding can pass the HIV virus on to her baby	Count	1127	207	195
	%	73,7%	13,5%	12,8%
4. HIV/AIDS can be cured	Count	204	193	1132
	%	13,3%	12,6%	74,0%
5. The presence of a sexually transmitted disease can increase the risk of HIV transmission	Count	1175	192	164
	%	76,7%	12,5%	10,7%
6. A pregnant woman who has HIV/AIDS can pass the HIV virus on to her unborn baby	Count	1437	42	52
	%	93,9%	2,7%	3,4%
7. TB can be cured if treatment is given early enough	Count	1474	44	12
	%	96,3%	2,9%	0,8%
8. There is a difference between being HIV-positive and having AIDS	Count	1317	64	149
	%	86,1%	4,2%	9,7%
9. A person can be HIV-positive for many years without becoming ill	Count	1438	54	40
	%	93,9%	3,5%	2,6%
10. Tuberculosis (TB) is often considered to be an AIDS related disease	Count	692	225	612
	%	45,3%	14,7%	40,0%

11. You can tell by looking at someone that they are infected	Count	65	71	1393
	%	4,3%	4,6%	91,1%
12. You can become infected by touching the body of a person who has HIV/AIDS	Count	35	20	1476
	%	2,3%	1,3%	96,4%
13. You can become infected by kissing a person who has HIV/AIDS	Count	214	149	1167
	%	14,0%	9,7%	76,3%
14. You can become infected by sharing food or eating utensils with a person who has HIV/AIDS	Count	88	82	1361
	%	5,7%	5,4%	88,9%
15. You can become infected by using Syringes/needles previously used by a person who has HIV/AIDS	Count	1507	6	17
	%	98,5%	0,4%	1,1%
16. You one can become infected by having unprotected (no condom) sex	Count	1518	2	11
	%	99,2%	0,1%	0,7%
17. You can become infected by being bitten by a mosquito that previously bit an HIV-infected person	Count	222	377	931
	%	14,5%	24,6%	60,8%
18. You can become infected by using the same toilet seats as HIV-infected people	Count	57	79	1396
	%	3,7%	5,2%	91,1%
19. You can become infected by being in contact with the perspiration (sweat) of a person who has HIV/AIDS	Count	51	152	1327
	%	3,3%	9,9%	86,7%
20. You can prevent becoming infected if you wear a condom	Count	1264	88	178
	%	82,6%	5,8%	11,6%
21. There are female condoms that are effective in the prevention of HIV transmission	Count	574	551	405
	%	37,5%	36,0%	26,5%
22. Contraceptive practices such as the pill etc. can also prevent HIV-transmission	Count	30	56	1444
	%	2,0%	3,7%	94,4%
SECTION C: DISCRIMINATORY PRACTICES		**Disagree**	**Uncertain**	**Agree**
1. If you were infected, do you believe that your colleagues would avoid you if they found out that you had HIV/AIDS?	Count	210	639	673
	%	13,8%	42,0%	44,2%
2. Would you feel comfortable working with a colleague if you knew that he/she was HIV-positive?	Count	314	396	818
	%	20,5%	25,9%	53,5%
3. Would you feel comfortable sharing toilets with an HIV infected colleague?	Count	356	305	868
	%	23,3%	19,9%	56,8%
4. Would you feel comfortable sharing equipment/tools with an HIV-infected colleague?	Count	347	252	928
	%	22,7%	16,5%	60,8%
5. Would you feel comfortable sharing cutlery/crockery with an HIV-infected colleague?	Count	417	297	814
	%	27,3%	19,4%	53,3%
6. Do you believe that CO. X would attempt to dismiss you if they found out that you were HIV positive?	Count	986	426	115
	%	64,6%	27,9%	7,5%
7. Should you become infected with HIV /AIDS would you tell your manager/supervisor?	Count	598	494	433
	%	39,2%	32,4%	28,4%
8. Should you become infected with HIV/AIDS would you tell your HR manager?	Count	576	474	476
	%	37,7%	31,1%	31,2%

The descriptive statistics for different educational levels are depicted in Table 5. From Table 1 it is clear that the majority of respondents are University graduates. Respectively, 284 respondents (19%) are in possession of a High School diploma and 267 respondents (18%) are in possession of a college or technicon qualification.

Given the sample size, statistically significant differences (Table 6) were found in the mean scores between levels of education and knowledge levels of the respondents.(F 2; 1511 = 34,776, p < 0,0005). However, based on the effect size, Partial ETA Squared (Table 2), the effect of level of education on knowledge is relatively small as ETA = 0,21 < 0,3

Table 5
Descriptive statistics according to levels of education

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound	Minimum	Maximum
College/ Technicon	267	82,1927	10,82341	0,66238	80,8885	83,4969		
High school	284	78,5851	13,19370	0,78290	77,0441	80,1262	36,36	100,00
University	963	84,4898	9,67387	0,31174	83,8780	85,1015	31,82	100,00
Total	1514	82,9771	10,85558	0,27899	82,4298	83,5243	31,82	100,00

Table 6
Anova: Comparisons of levels of education in respect of level of knowledge

	Sum of Squares	df	Mean Square	F	Sig.	ETA
Between Groups	7845,893	2	3922,947	34,776	0,000	0,210
Within Groups	170451,376	1511	112,807			
Total	178297,270	1513				

ETA
0,1 – 0,3 (Small effect)
0,4 – 0,5 (Moderate effect)
> 0,5 (Large effect)

Table 7
Levene's test of equality of error variances

Levene Statistic	df1	df2	Sig.
19,994	2	1511	0,000

The results of the Levene's test for equality of error variances are depicted in Table 3. As the null hypotheses of equal variances is rejected (see Table 7), Dunnett T3 post hoc tests are used to ascertain which of the educational groups differ significantly.

Table 8
Post Hoc tests: Multiple comparisons between levels of education

						95% Confidence Interval	
	(I) (Recoded) Highest education level	(J) (Recoded) Highest education level	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Dunnett T3	College/ Technikon	High school	3,6076(*)	1,02552	0,001	1,1515	6,0636
		University	-2,2970(*)	0,73207	0,005	-4,0523	-0,5418
	High school	College/ Technikon	-3,6076(*)	1,02552	0,001	-6,0636	-1,1515
		University	-5,9046(*)	0,84268	0,000	-7,9254	-3,8838
	University	College/ Technikon	2,2970(*)	0,73207	0,005	0,5418	4,0523
		High school	5,9046(*)	0,84268	0,000	3,8838	7,9254

*The mean difference is significant at the 0,05 level.

The results of the Dunnett T3 post hoc tests for the different educational levels are depicted in Table 8. From Table 8 it is clear that there are significant differences in mean between the groups: College/Technicon, High School and University graduates. From Table 5 it is clear that respondents who have a University degree have a higher level of knowledge than respondents who have a High School or Technikon qualification.

Table 9
Descriptive statistics on gender groups

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Percentage correct on level of knowledge	Female	902	82,3523	11,16853	0,37187
	Male	627	83,3913	10,91232	0,43580

The descriptive statistics for gender groups are depicted in Table 9 and indicate that 902 (59%) respondents are female and 627 (41%) are male.

Table 10
T-Test: Independent comparison of the mean difference scores of the different gender groups

Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)
Percentage correct on level of knowledge	Equal variances assumed	0,875	0,350	-1,806	1527	0,071

No statistically significant differences (Table 10) were found in the mean scores pertaining to the level of knowledge between the different gender groups [t(df =1527) = -1,806, p =0.071 > 0,05]. Based on Partial ETA Squared (Table 11) only 4.6% of the variance in level of knowledge can be attributed to differences in gender scores. Hence the observed differences between gender groups are neither of statistical significance nor of practical significance.

Table 11
Directional measures

			Value
Nominal by Interval	Eta	Percentage correct on level of knowledge Dependent	0,046

ETA
0,1 – 0,3 (Small effect)
0,4 – 0,5 (Moderate effect)
> 0,5 (Large effect)

Table 12
Descriptive statistics on age groups

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound	Mini-mum	Maxi-mum
24 and younger	295	82,6502	11,66458	0,67914	81,3136	83,9868	31,82	100,00
25-29	496	84,5308	9,44966	0,42430	83,6971	85,3644	31,82	100,00
30-39	427	82,7656	10,75391	0,52042	81,7427	83,7885	40,91	100,00
40 and older	313	79,9303	12,87195	0,72757	78,4987	81,3618	36,36	100,00
Total	1531	82,7356	11,12108	0,28422	82,1781	83,2931	31,82	100,00

The descriptive statistics for age groups are depicted in Table 12 and it is clear that that the majority of respondents fall in the age categories 25 – 29 (32%) and 30 – 39 (28%) years. The remainder of respondents were 24 years of age and younger (19%) and 40 years of age and older (20%).

Table 13
ANOVA: Comparisons of levels of knowledge in respect of age groups

	Sum of Squares	df	Mean Square	F	Sig.	ETA
Between Groups	4064,230	3	1354,743	11,172	0,000	0,147
Within Groups	185163,763	1527	121,260			
Total	189227,993	1530				

ETA
0,1 – 0,3 (Small effect)
0,4 – 0,5 (Moderate effect)
> 0,5 (Large effect)

Given the sample size, statistically significant differences (Table 13) were found in the mean scores of the different age groups (F 3; 1527 = 11,172, p < 0,0005). However, based on Partial ETA Squared (Table 9) the effect of the level of age on knowledge is relatively small as ETA = 0,147 < 0,3

Table 14
Levene's test of equality of error variances

Levene Statistic	df1	df2	Sig.
8,392	3	1527	0,000

The results of the Levene's test for equality of error variances are depicted in Table 14. As the null hypotheses of equal variances is rejected (see Table 14), the Dunnett T3 Post hoc tests are used to ascertain which of the age levels differ significantly.

Table 15
Post Hoc tests: Multiple comparisons between age groups

Percentage correct on level of knowledge

			Subset for alpha = 0,05	
	(Recoded) Age	N	1	2
Scheffe (a,b)	40 and older	313	79,9303	
	24 and younger	295		82,6502
	30-39	427		82,7656
	25-29	496		84,5308
	Sig.		1,000	0,150

Means for groups in homogeneous subsets are displayed.
a) Uses Harmonic Mean Sample Size = 365,538.
b) The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

The results of the Scheffe post hoc tests (for comparison between the different age groups) are depicted in Table 15. From Table 15 it is clear that the levels of knowledge of respondents in the age group 40 and older are significantly lower than that of respondents in the other age categories. However, it is important to note that, based on the Partial Eta Squared (0,147), the effect of age on the level of knowledge is relatively small. (0,147 < 0,3). See also Table 10 in this regard.

The descriptive statistics for respondents' perceived risk of becoming infected are depicted in Table 16. It is clear that the majority of respondents (62%) do not believe that it is likely at

all that they will become infected with HIV. 8% of respondents believe that they are somewhat likely and 2% believe that it is very likely that they will become infected with HIV. The remaining 27% of respondents are uncertain about their personal likelihood of becoming HIV-infected.

Table 16
Descriptive statistics on perception of contracting HIV

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound	Minimum	Maximum
Not likely at all	954	83,2762	10,47576	0,33917	82,6106	83,9418	31,82	100,00
Some what likely	125	85,5636	11,19470	1,00128	83,5818	87,5455	36,36	100,00
Uncertain	416	81,3265	11,90367	0,58363	80,1793	82,4737	36,36	100,00
Very likely	34	76,3369	13,27715	2,27701	71,7043	80,9695	45,45	95,45
Total	1529	82,7784	11,09924	0,28385	82,2216	83,3352	31,82	100,00

Table 17
ANOVA: Comparisons of levels of knowledge in respect of perception of contracting HIV

	Sum of Squares	df	Mean Square	F	Sig.	ETA
Between Groups	3493,769	3	1164,590	9,613	0,000	0,136
Within Groups	184745,209	1525	121,144			
Total	188238,978	1528				

ETA
0,1 – 0,3 (Small effect)
0,4 – 0,5 (Moderate effect)
> 0,5 (Large effect)

Given the sample size, statistically significant differences (Table 17) were found in the mean scores between levels of knowledge and perceived perception of contracting HIV/AIDS ($F\ 3;\ 1525 = 9{,}613$, $p < 0{,}0005$). However, based on Partial ETA Squared (Table 13) the effect of level of knowledge on perception is relatively small as $ETA = 0{,}136 < 0{,}3$.

Table 18
Levene's test of equality of variances

Levene Statistic	df1	df2	Sig.
2,854	3	1525	0,036

The results of the Levene's test for equality of error variances are depicted in Table 18. It is evident that the error variance for knowledge differences is unequal across groups ($p < 0{,}05$) and therefore the Dunnett is used to compare variances (Table 18).

The results of the post hoc tests are depicted in Table 19 which shows that there are significant differences in the mean level of knowledge between respondents who believe they know a great deal about HIV/AIDS and those who believe they have lower levels of knowledge. In particular, those who believe they know a great deal scored on average 86% for the knowledge test.

From Table 20 it is clear that level of knowledge correlates significantly negatively ($p < 0{,}0005$) with discriminatory practices (Pearson Correlation = -0,287). Due to the actual magnitude of the correlation we, however, conclude that the effect of level of knowledge on discriminatory practices is relatively small.

Table 19
Post Hoc tests: Multiple comparisons on levels of knowledge

	(I) (Recoded) Highest education level	(J) (Recoded) Highest education level	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Dunnett T3	A great deal	Enough	4,5155(*)	0,75320	0,000	2,5205	6,5105
		Just a little	11,6527(*)	0,93654	0,000	9,1792	14,1263
		Nothing	26,3409(*)	4,79511	0,002	10,7954	41,8864
	Enough	A great deal	-4,5155(*)	0,75320	0,000	-6,5105	-2,5205
		Just a little	7,1373(*)	0,70684	0,000	5,2713	9,0032
		Nothing	21,8254(*)	4,75558	0,007	6,2964	37,3545
	Just a little	A great deal	-11,6527(*)	0,93654	0,000	-14,1263	-9,1792
		Enough	-7,1373(*)	0,70684	0,000	-9,0032	-5,2713
		Nothing	14,6882	4,78804	0,066	-0,8541	30,2304
	Nothing	A great deal	-26,3409(*)	4,79511	0,002	-41,8864	-10,7954
		Enough	-21,8254(*)	4,75558	0,007	-37,3545	-6,2964
		Just a little	-14,6882	4,78804	0,066	-30,2304	0,8541

* The mean difference is significant at the 0,05 level.

Table 20
Correlations: Knowledge and discriminatory practices

Section 4 Factor (2,3,4,5)		Percentage correct on level of knowledge	Section 4 Factor (2,3,4,5)
Percentage correct on level of knowledge	Pearson Correlation	1	-0,287(**)
	Sig. (2-tailed)	0	0,000
	N	1532	1525
Section 4 Factor (2,3,4,5)	Pearson Correlation	-0,287(**)	1
	Sig. (2-tailed)	0,000	0
	N	1525	1525

** Correlation is significant at the 0,01 level (2-tailed).

There is no significant correlation between knowledge and behaviour; (Pearson's Correlation = 0,012, $p = 0{,}679 > 0{,}05$)

DISCUSSION

The main objective of this study was to determine if there is a relationship between increasing levels of knowledge about HIV/AIDS and perceptions of discriminatory attitudes and behaviour towards people with HIV/AIDS.

From the findings it is evident that respondents are generally knowledgeable about the transmission and prevention of HIV/AIDS. The results of this study indicate that respondents are

knowledgeable about the four main methods of HIV transmission, namely through sexual contact, through transfusion of contaminated blood, through the sharing of contaminated needles among HIV drug users and from an infected mother to her baby during pregnancy. Results of the survey also suggest that the majority of respondents were clear that HIV cannot be transmitted through casual contact such as sharing of communal toilets, sharing of cutlery and crockery and sharing of tools and equipment. A greater uncertainty was expressed regarding whether HIV can be contracted via exposure to an infected person's bodily fluids such as saliva and whether mosquitoes could transmit the virus. Specifically, a total of 23% were not sure as to whether one can be infected with HIV after kissing an infected person. 24% did not know about the likelihood of transmission of HIV through mosquitoes, while 14% believed incorrectly that one could be exposed to HIV from mosquitoes. Although all scientific data available leads to the conclusion that HIV cannot be transmitted through these modes, respondents appear not be convinced of this fact, as the above findings suggest. Results of this study corroborate the findings of research conducted in the Far East (Lim et al., 1999).

Considering the last mentioned findings, it is not surprising to find that 46% of employees would not feel comfortable or are uncertain about whether they would be comfortable working with an infected colleague. Although employees showed a high level of knowledge and awareness that HIV can not be transmitted through the various means of casual contact, 43% were not willing to or uncertain about using the same toilets as an infected person, 46% were not comfortable or uncertain about sharing crockery and cutlery and 39% were not comfortable or uncertain about sharing tools or equipment with an infected person. Although respondents indicated that they know that HIV cannot be transmitted through casual contact (as this is what they have been told) they may remain unconvinced of scientific findings because they worry that new evidence may come to light at a later date that points to the possibility of HIV transmission occurring through casual contact.

This study further highlighted that only 14% of employees believed that their colleagues would not avoid them if they found out that they had HIV or AIDS. The remaining 44% of respondents believe that they will be ostracised and 42% were uncertain about their colleagues' reactions should their HIV status become known. The last-mentioned finding substantiates findings of Barrows et al. (1996) and Lau and Wong (2001) that individuals believe that they will be discriminated against or that others will resist working alongside or avoid them if they were found to be HIV positive.

Despite the last mentioned scepticism and concern that respondents showed regarding the transmission of HIV by means of casual contact it is evident from the findings that, although the relationship between levels of knowledge about HIV/AIDS and discriminatory behaviour toward people with HIV/AIDS is relatively small, the level of knowledge correlates negatively with discriminatory practices. These findings corroborate the findings of research conducted by Chiliaoutakis et al. (1996). It would therefore appear that these results indicate that such respondents are able apply the data and information that they have received regarding HIV/AIDS in a meaningful manner which then results in non-discriminatory practices.

The study further assesses whether several comparison groups created in terms of the different biographical variables had differing scores with regard to level of knowledge. The results of this study indicated that there is a meaningful difference between the average levels of knowledge and respondents' education level and age. However, based on the effect size, the effect of level of education and age on knowledge is relatively small. This Survey's findings corroborate findings of Garbus (2002) in that no significant difference was found between the knowledge of men and women.

Findings of this study correspond to findings of De Bruyn (1998), Garbus (2002) and Norman et al. (2003) that AIDS knowledge is higher among people with more education and amongst younger people. In South Africa the lower knowledge of respondents 40 years and older can be ascribed to such employees having been less likely to have received sex education and HIV/AIDS education particularly in school in comparison to younger respondents. Linking findings back to earlier discussion regarding the formation of attitudes it could be argued that older respondents' meaning structures with regard to sex and sexually transmitted diseases may differ from those of younger respondents in that meaning structures were formed in the absence of exposure to HIV/AIDS. Older employees were thus required to fit the concept of HIV/AIDS (new information) into their already existing categories at a much later stage in their lives. According to Worchel et al. (1991) all new information is distorted to some degree in order to fit into already existing categories and existing categories have to expand to accommodate such information. Depending on a number of variables, including the extent to which the individual is set in his/her ways or willingness to change existing categories, accommodation of information regarding HIV/AIDS would or would not take place. In comparison, younger respondents formed their meaning structures inclusive of HIV/AIDS due to their exposure to HIV/AIDS from a much earlier age.

The same argument can be used for the findings that indicate that the higher the respondent's level of education the higher the level of knowledge. Respondents with a higher level of education may find it less difficult to assimilate and accommodate new information into existing concepts as this is primarily what training in any field teaches and requires an individual to do. It would therefore appear that both educational level and age may be contributing factors in the formation of different mental models.

Another interesting finding was that although no correlation was found between level of knowledge and behaviour that places one at risk of infection, a significant difference was found between level of knowledge and respondents' perceived risk of becoming infected (given the large sample size the impact thereof remains small). Respondents with high levels of knowledge perceived themselves to be at lower risk of infection and respondents with lower levels of knowledge perceived themselves as having a higher probability of becoming infected. The last mentioned findings correspond with Norman et al. (2003) findings that knowledge was associated with concern about personal risk of contracting AIDS. Findings may be attributed to respondents' (with a higher level of knowledge) understanding of the difference between putting themselves at risk for infection, thus having to make a pre-behavioral decision, and knowing when they are already at risk of being infected due to past decisions. Respondents with a higher level of knowledge are more likely to know that one increases one's risk of infection through high-risk practices such as having unprotected sex with a partner, having unprotected sex with sex workers who are at high risk of becoming infected themselves, by sharing needles/ syringes to inject drugs/ steroids or by having unprotected sex with individuals who have previously placed themselves at high risk of becoming infected. Results of the survey show that a concerning 8% of respondents (125 employees) believed that they were "somewhat" likely to become infected with HIV and that a further 2% of respondents (34 employees) believed that they were very likely of becoming infected. It would therefore appear that these respondents are evidently aware of their previous and current "risk" practices. The 27% of respondents who stated that they are uncertain about their personal likelihood of becoming infected with HIV may not understand/be knowledgeable about at-risk practices that place them at risk of HIV infection.

Despite the findings based on Partial ETA Squared that the effect of level of knowledge is relatively small, the findings of the research conducted still add value by means of determining the

various knowledge levels. Education regarding HIV/AIDS will continue to be a key component in any strategy to reduce or prevent stigma and discrimination against people with HIV/AIDS as stigma and discrimination may result in isolation and marginalization, increased vulnerability to infection and increased likelihood of general health risks (De Bruyn, 1998). The Employment Equity Act specifically protects individuals from discrimination and it is therefore important to identify possible discriminatory attitudes and practices, which might hold Labour Relations implications for the organisation. Discriminatory behaviour not only affects the employer employee relationship but can also damage the public's view of the organisation which will have other far-reaching negative consequences. According to Firmansyah and Kleiner (1999) AIDS discrimination in the workplace is not limited to the employer employee relationship but can also take place between business and its customers. The last-mentioned can have a further devastating impact on the organisation's bottom line.

The implications of these findings can be summarised as follows:

1. The provision of HIV/AIDS educational intervention programs are imperative in reducing discriminatory attitudes and behaviour towards people infected with HIV/AIDS.
2. By reducing discriminatory attitudes and behaviour one contributes to a milieu of acceptance and understanding which in turn assists in reducing fear and denial and thereby indirectly reduces the risk of new infections.
3. Current thinking regarding "at risk" groups such as younger age groups, should be reconsidered, since such "stereotyping of risk" can contribute to older individuals not perceiving themselves to be at risk when they may in fact be at higher risk due to their lower level of knowledge and past lack of exposure to sex and HIV/AIDS education.
4. HIV/AIDS intervention programs should have the dual aim of providing information, according to Bellinger et al. (2004) information is data that has been given meaning by way of relational connection, this meaning can be useful, but does not have to be, and education (knowledge and understanding). People first need information i.e. the facts, which will help to lay the foundation for health education.

Shortcomings of the study are the following:

1. It is focused mainly on knowledge of transmission, few questions regarding knowledge of prevention e.g. effectiveness of latex condoms vs. natural membrane condoms, the effect of oil based lubricants on condoms etc.
2. Fear and denial were not a main focus of the survey
3. The sample group is not representative of the general South African population (high educational levels)
4. Findings may be limited to the specific organisation due to its specific environmental setting
5. Cannot ascribe high level of knowledge to educational and other interventions offered by the organisation only. Other sources of information e.g. mass media campaigns, community-based and interpersonal interventions, informal networks e.g. friends and family may also have played a role.
6. Although it has been noted that both knowledge and a supportive and caring environment is required to adequately reduce stigma and discrimination, this study focused only on the link between knowledge and attitude towards those infected, and disregarded the structural components.

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