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An Investigation into Pupils' Understanding of Sexually Transmitted Diseases Including HIV/AIDS and Implications for Science Teaching

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Abstract: The object of this research study was to investigate pupils' understanding and knowledge of sexually transmitted diseases including HIV/AIDS. The research was done on a sample of junior secondary school pupils with an average age of 15 in 8 junior secondary schools. The sample contained 205 pupils of which 88 were boys and 117 were girls. The pupils were of average and above average ability. These pupils were given a questionnaire consisting of 4 sections, namely formal knowledge (content) consisting of 20 multiple choice items based on the junior secondary school science syllabus; non-formal knowledge consisting of 20 statements on sources of information on STDs and HIV/AIDS; sexual behaviour consisting of 15 statements and attitudes towards STDs and HIV/AIDS consisting of 16 statements. An analysis of pupils' responses showed an understanding of STDs and HIV/AIDS content covered in the science syllabus. However, some children's answers reflected a cultural influence (bias). Children were reluctant to answer some questions for fear of being noted to be actively involved in sexual activities. With regard to sources of information on STDs and HIV/AIDS, an analysis of pupils' responses showed that the major sources of information included teachers (science, guidance and counselling) Radio Botswana, Daily News and Posters in Labs. Pupils responded differently to statements on sexual behaviours, which reflect inconsistencies in their answers. Students' responses to attitudes towards STDs and HIV/AIDS reflect clearly an understanding of the consequences of engaging in unprotected sex. In conclusion some suggestions and recommendations were made to help teachers with skills, knowledge and instructional strategies that will enable them to effectively teach controversial topics such as HIV/AIDS and sexuality.

Key words: Investigation, pupils understading, transmitted diseases, implications, science teaching

INTRODUCTION

The problem of the killer disease, AIDS has renewed interest in the teaching of family life education. The school curriculum is now being reviewed to include AIDS education as its component (Revised National Policy on Education) (Republic of Botswana, 1994). The pandemic is reported to have attacked severely African countries, south of the Sahara (WHO, 1993). In the last 15 years, HIV/AIDS has evolved into a global pandemic. Sub Sahara Africa has borne the brunt of this pandemic because of the socio-economic, political and cultural factors that provided fertile grounds for an explosion of the disease' (http://www.idrc.ca/book/focus/832/chap6.html). The countries attacked by the AIDS pandemic include Botswana, Lesotho, Swaziland, Zimbabwe, Zambia and South Africa (Masupu *et al*., 2002). In terms of numbers of people infected with HIV and those suffering from full-blown AIDS, Botswana is leading. By the year 2002, 285,000 people were HIV positive and 28,000 had been estimated to have full blown AIDS, a disease which weakens people's immune systems making them vulnerable to attack by other pathogens (Masupu *et al*., 2002).

Interests in curbing the AIDS pandemic was marked by the establishment of the Sexually Transmitted Disease Unit (STD Unit) by the Ministry of Health whose task is to formulate strategies/guidelines on how to teach the public about STDs and HIV/AIDS. The Ministry has also established the National AIDS Control programme whose function is to raise AIDS awareness and to disseminate information on AIDS. This shows the seriousness Botswana Government attaches to this deadly disease.

Earlier studies sought to establish how people are infected with STDs and HIV/AIDS. Reviews along these lines have concluded that AIDS and other STDs are spread through sexual intercourse and use of intravenous needles for injecting IV drugs. Similar conclusions have been reached in studies that have examined the problem in Botswana, for example, Fee *et al*. (1993) and more recently Modungwa *et al*. (1999).

It has been documented in Botswana that AIDS is predominantly spread through sexual intercourse (Health Education Unit, 1997). Consequently, government has made some attempts to educate people on how to prevent or reduce the spread of AIDS by distributing condoms freely to the public. President Mogae has even made some

efforts to talk to people in different districts about AIDS and the number of people dying of it. Although government has launched a strong AIDS education campaign through radio, the media and health workers, citizens still die in large numbers. Research has been conducted in Sub-Saharan Africa including Botswana to identify reasons why people die of AIDS in large numbers.

The general observation from this line of investigation suggests that cultural and religious factors contribute to the spread of the disease (Selelo, 1994; Fee *et al*., 1993 and http://www.idrc.ca/book/focus/832/chap6.html). Culturally, Batswana do not talk publicly to children about sexuality. Feel *et al*. (1993) contend:

> "The discussion with parents confirm that while most parents would like to be able to inform and educate their young people about sexual issues, most felt that this was extremely difficult and not culturally acceptable".

It is believed that sex is something confidential and should be practiced by grown-ups and not by children. Modungwa *et al*. (1999) contend:

> Several studies on the other hand, show that adults including parents disapprove or do not acknowledge sexual activity among youth. This kind of attitude might prevent young people to seek information including services because seeking this kind of service might be equated with acceptance of sexual activity.

It is still believed that education on AIDS and HIV could promote behavioural changes among citizens. There seems to be a problem with this assumption as more and more people are being infected with HIV/AIDS. There is some evidence to suggest that teenagers are sexually active in Botswana as indicated by the number of school drop-outs (Modungwa *et al*., 1999; Fee *et al*., 1993). There are continual school dropouts at Junior Secondary Level of Education. This suggests that school children are actively involved in unsafe sex. It has been reported that adolescent learners are a group of students, which are at a high risk of being infected with STDs and HIV/AIDS (Young, 1996). It has been reported that children do not know that having sexual intercourse could put them in the risk of being infected with STDs including HIV/AIDS (Heaven, 2001).

To curb the spread of the HIV/AIDS pandemic, some countries included AIDS education in their school curriculum (Gauchuhi, 1999). Studies conducted in these countries have reported that many teachers feel embarrassed when handling sensitive topics related to sex. Furthermore, the studies revealed that teachers were found to be reluctant to teach pupils about sexuality even after they had received in-service training. The same findings were reported in Zimbabwe (Gauchuhi, 1999). Ntebela (1992) also reported that teachers in Botswana are uncomfortable discussing the topic 'AIDS'. This is an indication that teacher lack strategies for teaching controversial topics.

Strategies for teaching controversial topics: Teaching is an art and not every teacher is creative or innovative. Teaching controversial topics in a Setswana culture is a very challenging task to undertake. A teacher must select the topic if it coincides with the aims of the program, if the material fits the maturity level of students, the nature of the community and how conflicts with the state could be avoided. Fortunately in Botswana all curricula are centralized, that is, they are under the auspices of the government. This means that even controversial topics such as AIDS and family life education are in the school curriculum because government education officers are in agreement with them. Although controversial topics are part of science curricula, they are not handled as other ordinary science topics.

There are basically two approaches, which teachers could use when dealing with controversial topics. The first approach is to desensitise the topic by infusing it into the curriculum as a normal topic. For example dealing with reproduction in other organisms prior to including the topic of human sexuality. Teachers should note that most controversial topics consist of precursor concepts that help explain in a non- threatening manner higher order principles in biology (Simpson, 1989). Helping students learn about reproduction by first exposing them to fundamental concepts is a way in which potentially controversial topics can be desensitised and be rendered normal subjects in the classroom. Most topics in the area of reproduction are fundamental concepts and as such students learn to consider them as normal in the course of biological events. The second approach to dealing with controversial topics involves inviting specialists to talk to students or to teach students. For example if you want to teach students about 'birth control methods' invite a local physician or a registered nurse to come and talk to students because they have potential to make this potentially sensitive topic 'more normal' (Simpson, 1989). It is also important for teacher to think carefully about the primary source and the manner in which the information will be delivered and how credible is the source of information. What is the best way to present the

information? Should it be through discussion or would obtaining an outside speaker be appropriate? Should I use a videotape or a film? These are some of the considerations that a science teacher should deal with when thinking of teaching controversial topics.
Simpson (1989) contends:

> "Another important consideration when dealing with controversial topics is that of fostering a climate of openness. The fact that something is controversial implies that there are different views and that with these views come strong feelings. The science teacher, therefore, should work hard to ensure that the classroom is a place where open forum can occur. Regardless of the logic behind a view, students should be given an opportunity to express freely what they think. As each idea is expressed the group can then examine what is said on the merits of its rationality and relevance. The important thing is that there exist a sense of trust and fairness so that free expression of thought is not inhibited".

The teacher should serve as role model and the topic to be addressed should provide opportunities for balanced discourse and examination of multiple perspectives by students. Furthermore, the crucial issue is to avoid intervening with the local community's cultural values. Teachers should give children assignments, which students will do at home and this will inform parents of exactly what is being done at school. It is also important for teachers who teach in junior secondary schools, to note that they are dealing with adolescents whose bodies are undergoing some changes all the time.

Theoretical considerations: The conceptual framework for this study is based on the universal premise that the youth are the most exploratory group of people. Their sexual experimentation puts them in the risk of being infected with STDs and HIV/AIDS (Sprintal and Collins, 1995). The risk of adolescents being infected with sexually transmitted diseases has been noted world wide. Gauchuhi (1999) asserts that the AIDS epidemic is now shifting towards the young. With increasing HIV/AIDS infection rates in Botswana, there is a growing concern about young people being infected with HIV.

Having realized that the youth are being infected with HIV, Vision 2016 contends' There is a major challenge to halt or reverse the rising incidence of the HIV virus, particularly amongst the young people, if Botswana is to advance in the next twenty years and beyond. The extent to which the adolescents in Botswana understand the consequences of indulging in unprotected sexual activities would reduce the infection rate including HIV/AIDS. It is important that mechanisms be put in place (strong AIDS education programme) that would strengthen children's knowledge and understanding of STDs and HIV/AIDS.

Sprintal and Collins (1995) noted that adolescence is a period of great physical emotion, social and psychological stress. Heaven (2001) on the other hand asserts that adolescents are less able to reason about risky and probability and therefore more likely to engage in sexual behaviour regarded as risky for HIV infection and pregnancy. In addition, hormonal factors induce adolescents' sexuality, thus awakening their sexual feelings and urges.

Statement of the problem: This research study proposed to examine junior secondary school children's knowledge of STDs including HIV/AIDS. The essence of investigating children's knowledge of STDs including HIV/AIDS is that the pandemic is now shifting towards the young people (Gauchuhi, 1999).

The major purpose of this study was four folds To assess the extent to which children have acquired basic knowledge and understanding of sexually transmitted diseases including HIV/AIDS, to assess children's sexual behaviours, to identify children's source of information on STDs and HIV/AIDS and to identify children's attitudes towards STDs and HIV/AIDS. To this end, answers were sought to the following questions:

- What is children's knowledge of STDs including HIV/AIDS?
- Where do children get of information on STDs and HIV/AIDS?
- Are there differences between males and females knowledge of STDs and HIV/AIDS?
- To what extent are children's sexual behaviours influenced by cultural factors?
- Is there a relationship between knowledge and sexual behaviour?
- Are there differences in knowledge in sexuality between rural and urban children?
- Are there differences in sexual behaviour between rural and urban children?
- Are there differences in attitudes towards STDs and HIV/AIDS between rural and urban children?
- To what extent are children's knowledge about STDs and HIV/AIDS influenced by cultural issues?
- To what extent are children's attitudes towards STDs and HIV/AIDS influenced by cultural factors?

Significance of the study: This study would be beneficial to teachers and educators in general in that it would provide them with strategies for teaching controversial topics such as sexuality. Studies conducted in Botswana on STDs and HIV/AIDS concentrated on teenage pregnancy, mortality and behavioural changes (Modungwa *et al*., 1999; Chilisa, 2001; Jack *et al*., 2001). Although these studies concentrated on the youth, they did not assess sexual activities of junior secondary pupils.

The findings of the study could lay a foundation for the inception of intervention programmes for the youth. Furthermore, a comprehensive AIDS education programme could be developed to provide pupils with information, which could change their attitudes and sexual behaviours.

MATERIALS AND METHODS

This study employed both quantitative and qualitative research methodologies. Research has indicated that the use of both methodologies tend to enrich the findings of the study and compliments each other where one methodology is deficient (Merriam, 1998).

Study sample: A cluster sampling method was used to select the subjects of the study. My clusters included urban, semi-urban and rural areas. Some Form 3 students at Matsheng in Sojwe, Mmashoro and Madikwe in Mmathubudukwane in Kgatleng, Kwena Sereto in Molepolole, Bakgatle in Mochudi, Donga in Francistown and Nanogang in Gaborone were the subjects of the study. The sample of the study consisted of 205 (117 girls and 88 boys) junior secondary school pupils who were in their last year of study. Four instruments whose descriptions are given below were administered to the children.

Description of instruments: Four instruments were used to collect data for the study. The descriptions of the instruments are shown below.

Formal knowledge instrument: The purpose of this instrument was to assess children's basic knowledge and understanding of sexually transmitted diseases including HIV/AIDS. The concepts used in the instrument were derived from Family Life Education Unit found in the Botswana junior secondary school science curriculum. The questions of the instrument were multiple choice items. The format of the instrument is based on AIDS Questionnaire developed in Britain by Harvey and Reisss (1990). It was not indicated that the instrument was validated. The reliability of the instrument was also not stated. The instrument was chosen on the basis that it was developed for the students of the same age and educational level.

To suit Botswana situation, a panel of experts validated the instrument. The panel matched the objectives of Family Life Unit with the questions. The panel agreed that 75% of the questions tested the objectives of the unit. The objectives of Family Life Unit are:

- Pupils will recognize and appreciate sexual behaviour problems associated with adolescents.
- Pupils will acquire skills to take the right decisions to avoid pregnancy.
- Pupils will acquire basic knowledge of sexually transmitted diseases and HIV/AIDS.
- Pupils will be aware of the prevalence of HIV/AIDS and its seriousness.

The reliability of the instrument was established by administering the test twice (Test-Retest Method) to Form 3 students in 3 junior secondary schools, namely Mannathoko, Sir Seretse Khama Memorial and Artesia Junior secondary schools. The reliability coefficient was calculated to be 0.64.

The scores on the instrument indicated to us whether students had limited knowledge and understanding of STDs including HIV/AIDS. The instrument contained 20 multiple choice items each with a list of four possible answers. There was only one correct answer and therefore the maximum point was 20. Students were allotted the points according to their correct responses.

Non-formal knowledge instrument: The purpose of the instrument was to find out where children get information on STDs including HIV/AIDS apart from the science curriculum. The instrument contained 20 statements on sources of information on STDs and HIV/AIDS. The items, which were in the instrument for the study, were chosen on the basis that they were used for collecting data in junior secondary schools (Fee *et al*., 1993).

A panel of experts validated the instruments by putting the 20 statements under two headings, namely 'Human and Material Sources'. The same Community Junior Secondary Schools used for the Formal Knowledge Instrument were used to establish the reliability of the instrument. It was calculated to be 0.93 using Crobach alpha. A five point Likert Scale was used for scoring. The categories were Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D) and Strongly Disagree (SD). The

distribution of the scores was 5 for SA, 4 for A, 3 for N, 2 for D and 1 for SD. The reverse was done for items showing negative statements.

Sexual behaviour instrument: The purpose of this instrument was to identify the sexual behaviours of children. The items used in the instruments were derived from Fee *et al*. (1993). The instrument contained 15 statements on sexual behaviours.

A panel of experts validated the instrument by putting each statement under 'Self, Assertiveness, Lack of Assertiveness, Causal Sex, Sexual Violence, Family Influence, Cultural and Religious Factors'. The same Community Junior Secondary Schools used for the Formal Knowledge Instrument were used to establish the reliability of the instrument. It was reported to be at 0.79 using Cronbach alpha.

A five point Likert Scale was used for scoring. The categories were Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D) and Strongly Disagree (SD). The distribution of the scores was 5 for SA, 4 for A, 3 for N, 2 for D and 1 for SD. The reverse was done for items showing negative statements.

Attitudes towards STDs and HIV/AIDS: The purpose of this instrument was to assess the attitudes of children towards STDs and HIV/AIDS. The instrument contained 16 statements on attitudes. The items of the statements were derived from Fee *et al*. (1993).

A panel of experts validated the instrument by putting them under 'Self-Development, School, Self-Concept, Peer Influence, Personality and Knowledge'. The same Community Junior Secondary Schools used for the Formal Knowledge Instrument were used to establish the reliability of the instrument It was reported to be 0.72 using Cronbach alpha.

A five point Likert Scale was used for scoring. The categories were Strongly Agree (SA), Agree (a), Neutral (N), Disagree (D) and Strongly Disagree (SD). The distribution of the scores was 5 for SA, 4 for A, 3 for N, 2 for D and 1 for SD. The reverse was done for items showing negative statements.

After marking students' work data were analyzed as shown below.

Quantitative data

Knowledge instrument: Raw scores of students on the Knowledge Instrument are as follows: Kwena-Seroto (Semi-urban) 75%; Mmashoro (Rural) 57%; Nanogang (Urban) 85%; Bakgatle (Semi-urban) 80%; Donga (Urban) 80%; Madikwe (Rural) 80% and Matsheng (Rural) 75%.

The knowledge instrument test was marked out of 20 and the raw scores were converted into percentages.

Sources of information on STDs and HIV/AIDS: The results of students' sources of information, which is where students access information on HIV/AIDS, are show below.

Bakgatle: Bks = 6, ST = 20, GT = 34, HW = 2, P= 4, Pa = 10, RB =24, NP =20, TV = 8, SW =3, SM, = 0, Po = 19, SB, 6, CH =15, Chi =13.

Nanogang: Bks = 12, ST = 20, GT = 19, HW = 5, P = 10, Pa = 34, RB = 20, NP =15, TV = 35, SW = 0, SM, = 15, Po = 30, SB, 5, CH = 25, Chi = 0.

Madikwe: Bks = 3, ST = 28, GT = 20, HW = 3, P = 0, Pa = 8, RB = 21, NP = 18, TV =11, SW = 4, SM, = 0, Po = 13, SB, 2, CH =13, Chi = 5

Matsheng: Bks = 5, ST = 19, GT = 15, HW = 5, P = 2, Pa = 5, RB = 20, NP = 15, TV = 0, SW = 3, SM, = 0, Po = 15, SB, 1, CH = 11, Chi = 2.

Donga: Bks = 10, ST = 21, GT = 17, HW = 2, P = 3, Pa = 20, RB = 19, NP = 20, TV = 10, SW = 1, SM, = 10, Po = 16, SB, 10, CH = 17, Chi = 0.

Kwena-sereto: Bks = 8, ST = 30, GT = 23, HW = 2, P = 5, Pa = 20, RB = 19, NP = 20, TV = 19 , SW = 1, SM, = 10, Po = 16, SB = 0, CH = 19, Chi = 3.

Mmashoro: Bks = 2, ST = 32, GT = 21, HW = 6, P = 1, Pa = 3, RB = 17, NP =13, TV = 0, SW = 8, SM, = 0, Po = 18, SB, 2, CH = 4, Chi = 9.

N.B: Bks = Books, ST = Science Teachers, GT = Guidance and Counselling Teachers, HW = Health Workers, P = Peers, Pa = Parents, RB = Radio Botswana, NP = Botswana Daily News Paper, TV = Television, SW = Social Workers, Po = Posters in the Lab, SB = Siblings, CH = Church, Chi = Chiefs, SM = School Magazine.

From the above information provided by children, the most popular sources of information for them include Science Teachers, Guidance and Counselling Teachers, Radio Botswana, Botswana Daily News and Posters in the Lab.

Other variables of the study are reported (Table 1-4).

Sexual behaviours and cultural values: The Table 1 shows a relationship between cultural factors and sexual behaviour.

Table 1: A table showing the relationship between sexual behaviours and cultural factors

		Cultural factors
Sexual behaviour	Pearson correlation	0.201
	Sig. (2-tailed)	0.004

Table 2: A table showing the relationship between sexual behaviour and knowledge of STDs and HIV/AIDS

		Knowledge of STDs including HIV/AIDS
Sexual behaviour	Pearson correlation	0.216
	Sig.(2-tailed)	0.002

Table 3: A table showing the relationship between knowledge and cultural factors

	N	Correlation	Sig.
Knowledge and cultural factors	205	0.185	0.008 (2-tailed)

Table 4: A table showing the relationship between attitudes and cultural factors

	N	Correlation	Sig.
Attitudes and cultural factors	205	0.201	0.004 (2-tailed)

Sexual behaviour and knowledge: The Table 2 shows a relationship between children's knowledge of STDs and HIV/AIDS and their sexual behaviour.

Knowledge and cultural factors: Table 3 shows the relationship between knowledge and cultural factors.

Attitudes and cultural values: Table 4 shows a relationship between attitudes and cultural factors.

To enrich the quantitative data, unstructured interviews were conducted. These were based on children's responses to the knowledge instrument. A total of 4 children were interviewed after marking their work on the instrument. These included 2 boys and 2 girls.

Qualitative data

Interviews: The purpose of the interview was to give children an opportunity to explain their responses to some questions of the questionnaire. Merriam (1998) asserts that interviews shed some light on some issues or answers that the researcher was not aware of. Malebogo and Bobby are 17 years old doing Form 3 at Matsheng. Matsheng is a community junior secondary school in a rural area in Kweneng District Council. Malebogo is a girl while Bobby is a boy. Lorato and Kutlo are doing Form 3 at Nanogang in Gaborone. Lorato is a 15 year old girl while Kutlo is a 16 year old boy. These children were above average in ability. The interview was conducted in English.

I = Interviewee (Researcher), M = Malebogo, B = Bobby, L = Lorato and K = Kutlo

I: I am going to ask you Bobby and Malebogo questions on STDs and HIV/AIDS. I want you to feel free and to be relaxed. Where you don't understand, please ask for clarification. I shall repeat the question. Bobby, what do the letters AIDS stand for?

Bobby: 'AIDS", what do they stand for? Yah, I think they stand for Acquired Immuno- Deficiency Syndrome. Yes, that is what ours science teachers said.

Malebogo: Yes, AIDS is a disease caused by HIV virus. AIDS results from damage done to the immune system by HIV virus. Some people say AIDS is a curse from God. I believe it is true.

I: Can AIDS be cured?

Bobby and Malebogo: No, AIDS is a disease that cannot be cured. We get information on HIV/AIDS from newspapers, Radio Botswana, guidance and counselling teachers. All these people and newspaper say AIDS cannot be cured, yet some people still go to traditional doctors and prophets for treatment.

Malebogo: Some people say AIDS is caused by witches. They blame witchcraft for the existence of the disease.

I: Thank you, you know a lot about AIDS. Can you tell me how one can avoid being infected with HIV/AIDS.

Bobby: By abstaining. We were told never to have sex by our science teacher.

Malebogo: That is not realistic Bobby, yes, abstinence is the best way but do people do that? No! so I think the best way is to use condoms, you remember what our science teacher said as well. One of our traditional leaders also mentioned that circumcision could help reduce infection rates. I don't know if this is true.

I: Yes, it may reduce infection but may be people should use condoms if they cannot abstain.

I: Is it easy to identify a person suffering from AIDS?

Malebogo: No, sometimes they look fresh and one is deceived into believing that they are healthy.

Bobby: M-m, its difficult. It's not easy to identify the person especially when they were recently infected. I think compulsory testing for HIV infection should be put in place so as to identify people who are HIV positive. But when the person is ill, yes you can identify him/her.

I: You know a lot about AIDS do your parents ever talk to you about it?

Malebogo: Not my parents, they won't talk about AIDS. My father says he will not talk about AIDS with young people.

Bobby: My father is a member of AIDS committee and he talks a lot about AIDS. He is also a Chairperson of Home-Based Care Committee, so in my family we talk a lot about AIDS.

I: Bobby and Malebogo, I would to thank you for providing valuable information on HIV/AIDS. Thank you.

I: Lorato and Kutlo, I would like to ask you questions on STDs and HIV/AIDS. In 2006, over 300 000 people in Botswana were infected with HIV/AIDS, what could be the cause of such high infection rate?

Lorato: Men in Botswana always want to have more than one partner; this is how infection is transmitted. Manhood is shown by having many girl friends. This is a major problem in Botswana.

Kutlo: Yah, the infection rates could be kept to a minimum if people stick to one partner. I think our culture contributes to the high infection rates. In our culture men can spend a night outside home with a girl friend. This is acceptable. Women do not have to ask men where they spent a night. I think another thing that contributes to high infection rates is the use of alcohol. There is excessive drinking in Botswana and people are tempted to engage in unsafe sexual activities.

I: I wish to thank you for spending your valuable time with me on issues that affect the nation's life. Thank you.

RESULTS AND DISCUSSION

Quantitative data: The findings of this study have indicated that the subjects used had a basic knowledge and understanding of STDs including HIV/AIDS. The performance of students on Formal Knowledge Instrument was well above average. The grand mean for students is 15.7 out of the expected mean of 20 if the pupils were to get all items of the instrument correct.

The findings of the study also indicated the major sources of information on STDs and HIV/AIDS as science teachers, guidance and counselling teachers, Radio Botswana, Botswana Daily news and Posters in the Lab. Some very important sources of information such as parents, priests have been reported to give unrealistic advice on sexual matters as indicated by the quotation given by the authors of communicating with adolescents about AIDS-chapter 6:

> While there are those who are thought to be legitimate sources of information on sexuality, such as parents and religious leaders, they are reluctant to offer other behavioural choices other than abstinence. (http://www.idrc.ca/books/focus/832/chapter 6 . html.)

The findings of the study have also indicated that both boys and girls possess the same knowledge and understanding of STDs and HIV/AIDS. This is not surprising since junior secondary science curriculum contains all the information which is taught equally to both boys and girls. With regard to sexual behaviours, cultural factors are reported to be very influential. Therefore, the teaching of AIDS should not be divorced from culture. http://www.idrc.ca/book/focus/832/chapter6.html. asserts that in the African culture, messages on issues concerning sexuality may not be effective because they are in conflict with cultural expectations. It is not allowed to talk about sexuality in front of children because some cultures contend that such talks would encourage children to engage in sexuality. Balmer (1994) says 'this lack of explicitness in sexual matter is hardly surprising in the African culture where young people are to learn from observation ". Many cultures in the region do not have the language to describe sexual matters" ((http://www.idrc.ca/book/focus/832/chapter6.html. Cultural issues could contribute to an increase in infection rates amongst the youth. (http://www.idrc.ca/book/focus/832/chapter6.html) contends:

> It was clear that culture had a significant impact on risk behaviour and at the same time tremendous potential for addressing the same issues. It was recognized that the disease HIV/AIDS when explained on both cultural and biomedical framework the infection was reduced. Explanations on the effects of HIV/AIDS on people without including cultural perspectives tend to be superficial.

However, traditional systems are reported to have broken down and the modern system which is in use does not provide an alternative and as such, a problem of high infection still exists, therefore, employing both traditional systems and modern ones would provide a better way of teaching children on how to reduce infection.

The findings of the study have also suggested the existence of a relationship between knowledge and sexual behaviour. However, there seems to be a discrepancy between knowledge and sexual behaviour (Jack *et al*., 2001). In support of the above observation, AIDucation Brochure (2001) also noted:

> Many young people practising unprotected sex become infected with STDs and are in need of prompt and effective treatment. All too often however, they are reluctant to seek treatment because of fear of being judged. Rather than face scolding and humiliation, many don't seek professional help and continue to have unprotected sex. This in turn exposes them and their sexual partners to HIV infection.

Modungwa *et al*. (1999) also observes that adolescents though have some knowledge on the consequences of indulging into unsafe sexual activities; yet they still practise it because parents disapprove of talking to them about sexual matters. Therefore, they need to satisfy their needs. A study by Jack *et al*. (2001) reported that students at the University of Botswana know a lot about the dangers of engaging in unsafe sexual activities, yet they still practice it.

The findings of this study have indicated that a non-significant relationship exists between knowledge and residential area. In view of the fact that junior secondary science curriculum is used in both rural and urban areas, it is not surprising that their knowledge of STDS and HIV/AIDS is the same. However, other studies have reported that knowledge of children on STDs and HIV/AIDS in rural areas is lower because there are few sources of information in such areas (Modungwa *et al*., 1999).

The findings of the study reported a non significant relationship between sexual behaviour and residential area. This means a child's sexual behaviour is not influenced by where he/she stays. The sexual behaviour of the subjects of the study tends to be the same irrespective of where they come from. However, some studies have indicated that the sexual behaviours of children from rural areas are not the same as those of children from urban areas (Fee *et al*., 1993). Sexual activities of rural students are very high as shown by the number of school dropout in these areas. The HIV infection rate is also reported to be very high in rural areas (Fee *et al*., 1993).

The attitudes of students towards STDs and HIV/AIDS from urban and rural areas do not differ. The general conclusion from the attitude instrument suggests that students from both urban and rural do not want to be infected. In addition, these students are sympathetic to those who are infected. This is inline with Batswana culture. Batswana have a proverb which says "O se tshegetshege yo o oleng mareledi a sale pele" which literally translates "Do not laugh at AIDS victims, you may be next".

Qualitative data: The few comments made by students in the interview were very illuminating indeed. The responses clearly show that students have an understanding and knowledge of STDS including HIV/AIDS. However, some issues that came out in the interview were worrisome, especially, witchcraft, curse from God and the acceptance of having multiple sexual partners. The HIV infection rates in Botswana is very high and this compounded by the fact that people stick to their cultural practices regarding sexuality. A large number of AIDS patients still go to traditional doctors for treatment. There is therefore an urgent need that traditional doctors are taught by government officers' health tactics that they could employ to convince HIV/AIDS patients to go to hospitals. Traditional doctors are a very important part of the system; therefore, excluding them from the issue of AIDS will not be fruitful. Unless people change their beliefs regarding AIDS, Botswana may not be successful in curbing the scourge.

Implications for science teaching: In order to reduce the infection rates amongst the youth, the teaching of AIDS must employ both scientific and cultural principles. This is to ensure that cultural explanations on AIDS which are embedded within our traditions/systems are not shunned. Empirical evidence elsewhere suggests that whenever issues relating to HIV/AIDS are explained within the cultural context people tend to understand them better (Gauchuhi, 1999).

There is a need for science curricula materials to be culturally sensitive to the knowledge base of learners. This stems from the fact that knowledge is culturally constructed by the cognising subject. If science curricula materials are culturally sensitive, they will be within students' cognitive maps and as such will be meaningful to them.

From the interview, there emerged another cultural issue that of parents not talking about sexual matters with their children. Talking about sexual matters was done by Batswana during the times when there were initiation schools where the youth were taught issues relating to life. At initiation schools boys were circumcised and when this was done the adults would talk about safe sexual matters/practices.

CONCLUSION

The issue of the youth being infected with STDs including HIV/AIDS is a reality. Adolescents are a sexuallyactivemembersofoursociety and therefore, if their knowledge on HIV/AIDS is assessed it will provide information which could be used to develop AIDS education programmes which will help to curb the spread of the scourge. However, the findings of this study suggests that impediments to lowering the infection rates include cultural principles, such as parents not willing to talk about sexual matters their children, acceptance of multiple sexual partners and the belief that AIDS can be cured by traditional doctors. Regarding sources of information on STDs and HIV/AIDS, science, guidance and counselling teachers are taking the lead. The information on STDs and HIV/AIDS tend to be very effective in promoting knowledge of students on the scourge as this is shown by the responses from children. The fact that science is a compulsory subject for all children is a commendable effort as all children are exposed to information on STDS and HIV/AIDS irrespective of where they come from. Children's knowledge and understanding of STDs and HIV/AIDS will save their life and consequently this could lead to an HIV/AIDS free nation.

RECOMMENDATIONS

The following recommendations are made based on the study:

- Comprehensive AIDS education should be introducedin schools to curb the spread of the virus. School-based programs are critical for teaching youth before behaviours are established. Research has clearly shown that the most effective programmes are comprehensive ones that include a focus on delaying sexual behaviour and providing information on how sexually active youth can protect themselves.
- Workshops on strategies for teaching controversial topics such as AIDS should be conducted for all teachers teaching adolescents. These will equip them with skills and expertise that will help them to be effective in transmitting messages that could help to curb the spread of the pandemic.
- School magazines: From the responses given by students, school magazines are not available in most junior secondary schools. This limits students' knowledge and understanding of STDS including HIV/AIDS. Empirical evidence elsewhere suggests that school magazines are very effective in disseminating information on HIV/AIDS.
- Talkback on HIV/AIDS should be instituted and should include parents, siblings, students, chiefs and church ministers. The talks should be broadcast over Radio Botswana because it is available to almost all people in Botswana. There seems to be less talk about HIV/AIDS. Regular talks about HIV/AIDS will change sexual behaviours of not only of the youth but also of adults.
- Authors of science textbooks: Books are the least source of information on HIV/AIDS yet they are widely read by children. Therefore, authors of science textbooks should have a chapter on the immune system in which scientific facts on HIV/AIDS are articulated in detail. Science textbooks used in Botswana junior and senior secondary schools have rather scanty information on HIV/AIDS. Therefore, there is a need for authors of science textbooks for secondary schools to give top priority to information pertaining to HIV/AIDS.

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