

Hearing-Impaired Learners: Are They Vulnerable to HIV Infection owing to Poor Knowledge?

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Abstract

Knowledge of the different transmission modes of HIV is vital to prevent HIV infection. The objectives of this study were to assess the knowledge of learners with hearing impairment on the different transmission modes of HIV to propose recommendations for healthcare workers to enhance the knowledge of these learners in a South African context. A quantitative descriptive cross-sectional study applying the convenient sampling technique was conducted with 99 learners from three public schools for learners with hearing impairment. The data were collected via a self-designed questionnaire and analysed through descriptive statistics. Only two of the respondents attained a knowledge score of 80 per cent on the different transmission modes of HIV, revealing a significant knowledge gap. The recommendations focused on enhancing communication through concrete examples, visual representations, and a gestural system (sign language). Training for professionals to deliver services in a culturally acceptable manner to enhance the knowledge of transmission modes of HIV by these vulnerable learners is needed.

Keywords: disability; HIV transmission modes; knowledge; learners

Introduction

Globally, it is estimated that 1.2 million people have died of acquired immune deficiency syndrome (AIDS) related illnesses, while 36.9 million lived with human immunodeficiency virus (HIV) by the end of 2014 (UNAIDS 2015). There were 25.8 million people living with HIV in sub-Saharan Africa in 2014. A high HIV incidence resulted in 1.7 million HIV-positive adolescents between the ages of 10 to 19 years in sub-Saharan Africa. The rate for new HIV infections is the highest within the age group of 15 to 24 years (UNAIDS 2014). Young people are faced with several



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risk factors such as peer pressure, unprotected sex, alcohol and/or drugs usage, multiple sexual partners, and sexual coercion or sex for reward (Maluleke 2010, 139). Within the South African context, HIV incidence and prevalence are considered among the highest in the world (Mall and Swartz 2012, 343; UNAIDS 2015).

There is a paucity of research in the disability field, with limited information available on the interrelationships between disability and HIV in South Africa (Hanass-Hancock, Regondi, and Naidoo 2013, 1). This deficit of knowledge might increase the HIV risk for this vulnerable group. Limited research on HIV and AIDS in the disability context, including providing prevention information, was also observed (Eide et al. 2011, 1595). The lack of information on the prevalence of HIV within groups of people with disabilities (PWD) may lead to assumptions that they (PWD) are not at risk of contracting the virus (Chireshe, Rutondoki, and Ojwang 2010, 17). Furthermore, there is a misperception of asexuality among the PWD (Aderemi, Pillay, and Esterhuizen 2013a:1). This misperception has perhaps played a major role in this vulnerable population being sidelined in HIV prevention efforts. South Africa reports a disability prevalence of approximately 24 per cent (Hanass-Hancock, Regondi, and Naidoo 2013, 1). Disability includes hearing impairment.

Hearing impairment, which is a reduction in hearing sensitivity, is considered disabling by the World Health Organization (WHO) when it exceeds 40 dB HL. There are approximately 278 million people globally who are hearing-impaired (Bell 2013, 47). Approximately 20 per cent of the South African population has some form of hearing impairment (De Andrade and Baloyi 2011, 310). Further research has shown that persons with hearing loss are among those who have been largely overlooked in global responses to HIV and AIDS (Hanass-Hancock, Regondi, and Naidoo 2013, 1).

Research among people living with HIV and AIDS (PLWHA) in Nigeria revealed knowledge gaps of HIV transmission (Adenuga 2009, 5). Similar knowledge gaps were identified in a South African study of parental anxieties regarding the risk of HIV infection to their children who present with hearing impairment (Mall 2012, iii). As a result of breakdown in communication, persons with hearing impairment are less able to access information on HIV and AIDS through auditory and visual input (Scheier 2009, 8). This places them at a greater risk of HIV infection as they may unknowingly engage in behaviours which promote, rather than prevent, the transmission of HIV. They may not possess the necessary cognitive competency or literacy levels to acquire this information from sources such as the internet or print media (Marx, Soer, and Dick 2011, 38).

The success of any prevention strategy depends on disseminating information to facilitate the empowering of the individual with knowledge (Adenuga 2009, 5). Although knowledge alone does not immediately translate into preventive behaviours, knowledge is essential for transforming behaviours (Adenuga 2009, 5). Hence

knowledge is considered the first, most basic tool, in empowering individuals to effect appropriate changes in their behaviour.

It was further found that hearing-impaired persons attend schools where there is limited focus on sexuality and HIV education, resulting in poor factual knowledge (Goldstein et al. 2010, 524). The perception that hearing-impaired youngsters do not engage in sexual activities, creates an additional barrier for them to openly discuss their lack of knowledge about sexually transmitted diseases with their parents and medical healthcare practitioners (Mall 2012, iii). Although the mode of communication in healthcare settings in developing countries is sign language, the lack of knowledge or skill or personal discomfort (from the practitioner) regarding talking about sexuality or sexually transmitted diseases may further widen the communication gap (Scheier 2009, 8). Within the South African context, this is exacerbated by the lack of trained sign language interpreters.

This study aimed at assessing the knowledge of PLWHA in a South African context on the different transmission modes of HIV. Secondly, it proposes recommendations for healthcare workers to enhance the knowledge of PLWHA on the transmission modes of HIV.

Research Process

The research setting involved three public boarding schools for PLWHA in one South African province. Two schools were in rural areas with limited access to audiologists and medical services. Learners who were 18 years and older were invited to participate in the study. These learners attend schools for children with special needs and are accommodated in the school system up to the age of 21 years.

A descriptive, cross-sectional quantitative design was considered applicable to explore the knowledge that PLWHA have of the different modes of transmission of HIV. Quantitative research is concerned with investigations that allow for precise measurement (Polit and Beck 2012, 739). A self-designed questionnaire was used to collect data. This comprised sections on demographic information, sources through which the learners had obtained information on HIV and its transmission modes, their knowledge of the actual transmission modes, as well as their preferred sources of information.

Descriptive research describes a phenomenon of interest (Sekaran and Bougie 2009, 105), hence its applicability to describing current knowledge of modes of transmission of HIV of PLWHA. The cross-sectional survey method facilitates the collection of large amounts of data in a standardised manner that is economical and efficient (Borg 2009, 361). In this study, the data were collected at a single point in time. This method was considered applicable as it allows for the collection of large amounts of data and information relating to the healthcare needs of this population.

There are eight schools for PLWHA in the identified province that fit the inclusion criteria on which the study was based. Non-probability sampling with convenient sampling was applied to invite six schools that were accessible to participate in the study. Only three schools were willing and gave permission to participate in the study. The data were collected at these three public schools for PLWHA from March to April 2014. The inclusion criteria were PLWHA between 18 to 25 years of age who were attending one of the three public schools identified and who were willing to participate. The exclusion criteria were PLWHA below the age of 18 years and those who were not willing to take part in the study. All the PLWHA that fitted the inclusion criteria of the study were invited to participate in the study. A joint sitting of the learners and the researcher as well as a sign language interpreter was held at each school. The study's aim and objectives, and also the process of informed consent, were discussed with the learners before data collection. There were 99 learners who chose to participate voluntarily and were presented with the questionnaires after they provided informed consent. Discussions on any possible misinterpretations of the items, such as questions and clarifications, were facilitated by the researcher and sign language interpreter. Learners completed the questionnaires and posted them in a sealed box.

Validity

The instrument was developed from a literature review. Validity was ensured by presenting it to field experts (a member of the deaf community and an educator) to ensure it was understandable to PLWHA. It was recommended that the questions be individually signed by a sign language communicator to enhance the respondents' understanding. This was incorporated during the data collection. Reliability was enhanced by applying Cronbach's alpha coefficient to ensure internal consistency.

Ethical Aspects

Ethical clearance was obtained from the Higher Degrees Committee of the Department of Health Studies, University of South Africa (reference number HSHDC/266/2013). Permission was obtained from the Department of Education, the Department of Health, and school principals, and informed consent was obtained from each respondent.

Data Analysis

Data analysis refers to the statistical processes applied to the data collected to determine if the research hypotheses are supported (Polit and Beck 2012, 739). The data collected were coded with the assistance of a statistician. The data were analysed with SPSS. Frequency tables and gender variations were computed, and general trends identified. Analyses of variance were computed to indicate the ranges of scores obtained. The chi-square test allowed for the comparison of two different variables, namely gender and knowledge. The findings of these analyses will be presented.

Results

Age

The respondents' ages ranged from 18 to 25 years (see Table 1).

Table 1: Age range of respondents (N = 99)

Age range	N	Minimum	Maximum	Mean	Standard deviation
Age	99	18.0	25.0	20.364	1.9455
Valid N	99				

The average age of the respondents was 20.3 years. The minimum age of 18 years was stipulated to ensure the respondents were able to provide consent by themselves.

Gender

Of the 98 respondents who indicated their gender, 49 per cent (f = 48) were male, and 51 per cent (f = 50) female (see Figure 1). One respondent opted not to answer this question (n = 98).

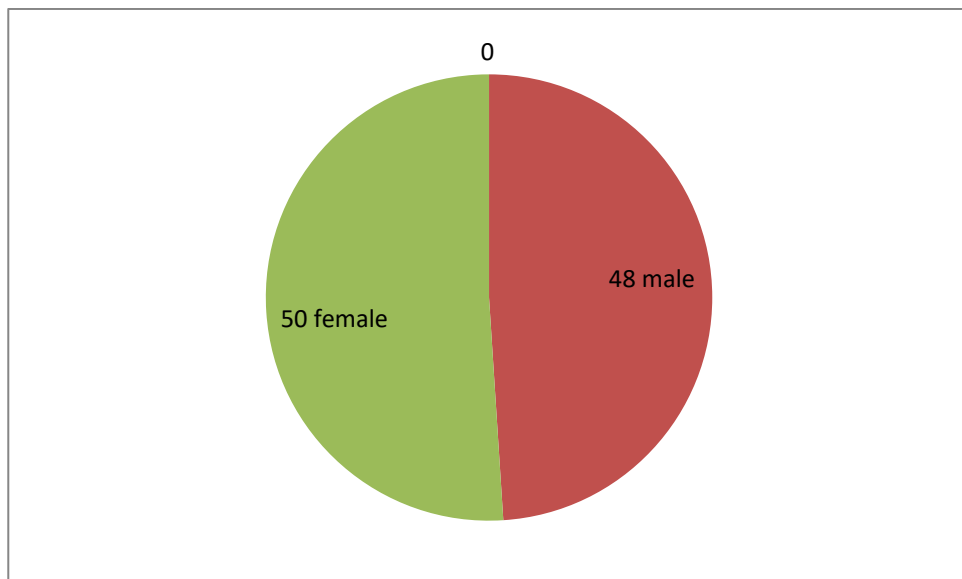


Figure 1: Frequency distribution of gender of respondents (n = 98)

Gender Differences on General Knowledge Statements

The results indicated that the male respondents scored higher on the knowledge of the modes of transmission of HIV than the female respondents. The male respondents obtained an average score of 11, while the female respondents recorded an average of eight (see Table 2).

Table 2: Mean knowledge scores related to gender

Gender	Sample mean	N
Male	11,163	48
Female	8,800	50

A significant gender difference on general knowledge statements was for the statement that indicated that PLWHA did not want to be seen with someone who is HIV positive. A total of 22 of the 46 male respondents (47.8%; $f = 22$) in the sample indicated that they did not want to be in the company of persons living with HIV (PLWH) (two male respondents did not respond to this statement). This is in contrast to the female learners where 13 out of 45 respondents (28.8%; $f = 13$) indicated discomfort with associating with PLWHA (five female respondents did not answer this question).

This is statistically significant at 10 per cent: $p = 0.063 < 0.10$ (see Table 3). This indicates the probability of having a type 1 error, which is incorrectly rejecting a null hypothesis.

Table 3: Chi-square test of gender difference in general knowledge of HIV ($n = 91$)

Gender differences	Value	df	Asymp. Sig. (2-sided)
Pearson chi-square	3.447 ^a	1	.063
Continuity correction	2.693	1	.101
N of valid cases	91		

Hence these results indicate a difference between male and female responses, such as a difference in the acceptance of PLWHA. Further, it is likely that on repeated administration of the questionnaire, similar results may be obtained. The Pearson's test of correlation measures the relationship between two variables, indicating magnitude (Polit and Beck 2012, 739). It was considered useful in this application as the questionnaire used a "yes/no" format to compare differences between the genders.

Knowledge Sources of Information

Nineteen out of 99 respondents (19.1%; $f = 19$) indicated schools or teachers as information sources. This was followed by the local clinics or hospitals as indicated by

13 out of 99 respondents (13.1%; $f = 13$), and the media by 10 out of 99 respondents (10.1%; $f = 10$). Perhaps rather appropriately, 49 out of 99 respondents (49.5%; $f = 49$) indicated that they had learnt about HIV and AIDS from more than one source.

Effectiveness of These Sources

Fifty-seven out of 83 respondents (68.7%; $f = 57$) indicated their teachers as being the most effective information source on HIV and AIDS. Clinics or hospitals ranked second by 38 out of 74 respondents (51.4%; $f = 38$) showing these as being most effective. The media ranked third as indicated by 49.4 per cent ($f = 38$), while parents (36.6%; $n = 71$; $f = 26$), religious leaders (31.7%; $n = 60$; $f = 19$) and friends or peers (14.1%; $n = 64$; $f = 9$) followed.

Knowledge of Transmission Modes of HIV

The researcher set a target of 80 per cent correct identification of modes of transmission and non-transmission to indicate adequate knowledge (as measured by the knowledge indicator) of the different transmission modes of HIV. A score of 70 per cent and below would serve to indicate poor knowledge. Only 2 of the 99 (2%) learners in this study obtained a maximum score of 80 per cent (see Table 4).

Table 4: Frequency distribution of respondents' knowledge of the transmission modes of HIV

Modes of transmission	True		False	
	<i>f</i>	%	<i>f</i>	%
HIV can be transmitted by:				
1. Having sexual relations with someone with HIV	52	54.2	19	19.8
2. Sharing needles with someone with HIV	52	54.7	23	24.2
3. Performing oral sex on someone with HIV	41	44.1	17	18.3
4. Kissing someone with HIV	37	37.4	44	44.4
5. Engaging in sexual acts with someone with HIV without a condom	62	64.6	18	18.8
6. Having contact with HIV-infected blood or other body fluids	64	68.1	13	13.8
7. Sharing razors with someone with HIV	48	51.6	17	18.3
8. Sharing linen or dishes with someone with HIV	17	18.9	42	46.7
9. Shaking hands with or sitting next to someone with HIV	27	31.0	42	48.3
10. An infected mother delivering a baby	43	47.3	18	19.8
11. An infected mother breastfeeding a baby	51	54.3	16	17.0
12. An infected father carrying a baby	28	30.8	33	36.3
13. An infected person having many sexual partners	66	71.7	12	13.0

Modes of transmission	True		False	
	<i>f</i>	%	<i>f</i>	%
HIV can be transmitted by:				
14. A family member with HIV coughing near you	58	60.4	26	27.1
15. Being bitten by an HIV-infected person	23	26.7	32	37.2
16. Talking to or hugging an HIV-infected person	19	19.8	58	60.4
17. Being bitten by mosquitoes	29	33.7	32	37.2
18. An infected person sneezing near you	43	47.8	28	31.1
19. By having a circumcision	33	37.9	21	24.1
20. Always wearing condoms during sexual activities	53	57.0	25	26.9
21. Always bathing or showering after unprotected sex	26	27.7	43	45.7
22. Having unprotected sex with someone whose status is not known	33	34.7	18	18.9
23. Having sex with a partner who is HIV positive while using a condom	45	47.4	35	36.8
24. Sitting with a person who is HIV positive	33	34.4	40	41.7
25. Swimming or surfing with a person who is HIV positive	23	24,0	39	40,6

Learners tended to have misperceptions of casual contacts being a mode of transmission. For each of the statements on casual contacts, such as being bitten by a mosquito, shaking hands with an HIV-infected person, sharing utensils with an HIV-infected person, 30 per cent of the respondents indicated that these were modes of transmission. That they were also not sure of the correct modes of transmission which clearly indicates definite knowledge gaps.

Preferred Communication Sources

Teachers were rated the highest preferred communication source on HIV and AIDS by 68 out of the 78 respondents (87.2%; $f = 68$). Clinics or hospitals (87.1%; $n = 85$; $f = 74$) followed, thereafter parents (68.8%; $n = 77$; $f = 53$), school or community rallies (65.3%; $n = 75$; $f = 49$), friends or peers (61.8%; $n = 68$; $f = 42$), while the lowest preferred choice of communication source was religious or cultural leaders (50.7%; $n = 67$; $f = 34$).

Preferred Communication Strategies

The most preferred communication strategy was the Internet as indicated by 70 out of 80 respondents (87.5%; $f = 70$).

Seventy-one out of 85 respondents (83.5%; $f = 71$) indicated they prefer individual or face-to-face contact at clinics or hospitals. This is in line with the information presented above, where the respondents wanted to access HIV education at these institutions.

The use of pictures or visual cues to relay information was supported by 49 out of 72 respondents (68.1%; $f = 49$). Thirty-eight out of 56 respondents (64%; $f = 36$) indicated they prefer using other strategies, although none were mentioned. This is possibly owing to the communication barrier, where they might have not understood the question, or could not spell out their response; hence choosing to omit more details.

Discussion

Ages and Grades of the Respondents

The average age of the respondents in this sample was 20.3 years. The age group of 18–25 years would most likely be on the verge of exiting the formal schooling system, and going out into the adult world of tertiary education or seeking employment opportunities. As a result of limited training and learning opportunities for hearing-impaired young adults, a fair proportion of those who leave school are likely to remain at home, reliant on their disability grants as a source of income (interviews with school principals March–May 2014).

The respondents in this age category were in Grades 8 to 12. Those who could not cope with the academic demands of these grades were in skills programmes. A large number of these learners might not complete Grade 12 owing to their poor literacy levels and/or reduced cognitive abilities, which further limit their employment opportunities. Schools for learners with special needs are obliged to accommodate them up to the age of 21 years. However, in school A, the learners were encouraged to continue accessing the skills programmes up to the age of 25 years, owing to the limited resources available to them. This, the principal believes, assists the community in caring for these vulnerable learners. Research has shown that those who are exposed to support within the school environment were less likely to engage in early sexual debuts and less likely to have multiple partners (Zuma et al. 2010, 53). Thus, these high risk factors for HIV infection might be alleviated.

Gender

The findings of this study indicated that the male respondents scored higher on HIV knowledge items than the female respondents. Differences between the genders and knowledge about HIV-transmission modes, prevention and treatment were also observed in studies conducted abroad, with the male respondents displaying more accurate knowledge (Srivastava et al. 2011, 88). A study done in the Congo indicated that male adolescents had a 54.3 per cent and female adolescents 45.7 per cent knowledge level on HIV (Mudingayi, Lutala, and Mupenda 2011, 15). Research has shown young women in the age group 15–24 years to have the poorest knowledge of

HIV transmission in South Africa (Eriksson et al. 2013, 464). A study done on gender differences in HIV knowledge among disabled people in South Africa indicated that women with disabilities have lower levels of HIV knowledge than men (Rohleder et al. 2012, 607).

The results of this study indicated the presence of more stigmatising attitudes among male learners (47.8% indicated a preference for not wanting to be seen with PLWHA) as compared to female learners (28.8%). This finding is in contrast with some research which acknowledged female learners stigmatising attitudes to PLWHA (Mukolo et al. 2013, 10).

The prevalence of HIV in 15–19-year old female learners is 2.7 times higher than that observed for young male learners (Eriksson et al. 2013, 464). Hence researchers and clinicians have called to increase the focus on female learners. The findings of this study call for a greater focus on HIV knowledge improvement for female learners.

General Knowledge of HIV and AIDS

A 2012 survey done in South Africa found that only 26.8 per cent of respondents had accurate knowledge about sexual transmission and prevention of HIV. Knowledge levels differed according to age, race and province. In this study, 44 out of 89 respondents (49.4%; $f = 44$) indicated that they did not understand the distinction between HIV and AIDS. A further 31 out of 89 respondents (34.8%; $f = 31$) had indicated that they had never heard of the disease. These figures are cause for concern as globally departments of health have bombarded their populations with information pertaining to HIV (Harrison et al. 2010, 11). Within the South African context especially, given the high rates of incidence and prevalence of HIV, an intensive campaign to raise awareness of the disease has been conducted. Clearly, the PLWHA at the schools where this study was conducted have either not been exposed to such information or they have not understood the information. Whether or not they had received the exposure via the curriculum is possibly also a confounding factor, as documentation indicates that life orientation lessons encompass this training (Department of Basic Education 2011).

A further area of concern would be that 37 out of 85 respondents (43.5%; $f = 37$) indicated that a cure for HIV does exist. The respondents who believed that HIV can be cured, reflect not only their poor knowledge of the condition, but also a possible confusion with other illnesses (Touko et al. 2010, 2). This erroneous belief may be associated with their not being able to fully understand the gravity of the disease might further exacerbate their vulnerability to possible HIV infection.

An additional cause for concern among the different stakeholders in HIV prevention is the belief that the disease is caused by witchcraft. Thirty-three out of 91 respondents (36.3%; $f = 33$) indicated that this was a mode of transmission. This was also reported

by previous studies (Adenuga 2009, 5). The existence of this misperception indicates that HIV prevention efforts need to be further strengthened.

Knowledge of HIV Transmission Modes

The 2012 South African survey indicated that television programmes was viewed as the most influential HIV information source for 40–50% of preadolescents, youths and young adults. Radio programmes were identified by one-third of respondents from all age groups as the second preferred information source. The researcher set a target of 80 per cent correct identification of transmission modes and non-transmission modes to indicate the possession of adequate knowledge (as measured by the knowledge indicator) of the different transmission modes of HIV. A score of 70 per cent and below would serve to indicate poor knowledge. Only two of the 99 (2%; $f = 2$) learners in this study obtained a maximum score of 80 per cent.

The learners tended to have many misperceptions of casual contacts being a mode of transmission. For each of the statements on casual contacts, such as being bitten by a mosquito, shaking hands with an HIV-infected person, sharing utensils with an HIV-infected person, approximately 30 per cent of the respondents indicated that these were transmission modes of HIV. That they were unsure of the correct transmission modes clearly indicates knowledge gaps. This is supported by studies cited earlier (De Andrade and Boloyi 2011, 309; Mall and Swartz 2012, 343).

It seems likely that the respondents in this study would have been exposed to the correct information during their life orientation lessons. Their curriculum from Grades 10–12 includes a section on “Development of Self in Society”, which includes topics on sexuality and HIV (Department of Basic Education 2011). Further, this exposure would have been in the correct medium of communication, from educators who understood the unique needs of the hearing-impaired. Hence the question remains as to how best to provide information on HIV and its different transmission modes to PLWHA.

Preferred Sources and Methods of Communication

A study done comparing HIV knowledge between learners with intellectual disabilities and non-disabled learners in Nigeria found that learners with intellectual disabilities as well as non-disabled learners preferred radio and television as sources of HIV information. Non-disabled learners also read about HIV in newspapers, books and magazines (Aderemi, Pillay, and Esterhuizen 2013b, 8). A combination of media and other sources of HIV information such as parents, teachers and health clinics increased the knowledge levels of non-disabled learners. A total of 74 respondents (87.1%; $f = 74$,) indicated their preferred source of information to be the clinics or hospitals, regarding face-to-face contact as the most effective. Teachers (87.2%; $f = 68$,) and schools (65.3%; $f = 49$,) were also ranked highly by the majority of respondents as providers of comprehensive HIV information. This may be related to these learners’ (PLWHA) need for confidentiality and privacy. This serves as an important indication

for healthcare personnel to consider the importance of receiving training in sign language. In addition, giving the learner full attention within the clinic setting, providing the necessary pen and paper, and appearing to be more empathetic, were perceived by PLWHA to be indicating genuine interest in them and their needs (Field Expert 1, April 2014). The preference for individual contact via the use of the Internet or direct contact is highlighted. A study showed that 56 per cent of the respondents indicated the use of the Internet as the preferred method of obtaining information about HIV (Goldstein et al. 2010, 524).

Learners with hearing impairment may experience limited literacy skills, cognitive abilities, and difficulties in understanding subtlety in language. This may relate to their preference for tailored information and concrete language. Communication barriers experienced by PLWHA when accessing healthcare indicate greater comprehension of information that is supported by additional visual cues (Scheier 2009, 8).

The UNAIDS calls for tailored interventions, relevant to different contexts, considering unique needs. In this regard, the ideology behind “Know your epidemic, Know your response” is especially pertinent (Case et al. 2012, 836). Focused interventions, which acknowledge the specific age and developmental needs of populations, have greater efficacy than broad-based generalised efforts (Nkansah-Amankra et al. 2011, 732). Hence, the importance of information presented in the correct medium, such as either sign language or information supplemented by visual cues. In addition, the use of simple language, when engaging with PLWHA, helps to facilitate understanding.

Conclusion

The results of this study indicate that PLWHA is a group that is especially susceptible to HIV infection as they lack basic knowledge of the disease and transmission modes. This may result in their not engaging in relevant preventive behaviours, thereby further exacerbating their vulnerability.

The difficulties PLWHA experience in accessing appropriate information, due to their poor sensory ability, as well as the possible cognitive delays alluded to previously, may result in fewer interactions with the world around them. This has the snowball effect of poor knowledge of transmission modes of HIV and prevention.

Recommendations

The findings of this study underscore the need for developing interventions which are context specific. It recommends that professionals working with PLWHA should consider the unique needs of these learners when relaying information of the transmission modes of HIV. Visual cues and a gestural system, preferably sign language, can be used to enhance the understanding of PLWHA. Gender sensitisation should also be considered, as the findings revealed that female learners have poorer knowledge of HIV transmission than male learners. Teachers were considered a

valuable source of information related to HIV, and their role in sharing HIV-related information should be emphasised. Especially PLWHA who live in hostel facilities at schools may view the teachers as parental figures and as an important source of education and guidance. Further investigation of HIV knowledge transfers to PLWHA and learners' experiences of communication barriers is required.

Limitations

The lack of statistics resulted in the researcher's inability to determine an appropriate sample size. Possibly, a bigger sample size would have yielded results that had greater applicability to the general hearing-impaired population. An additional shortcoming was that the researcher did not consider the use of a CD (featuring someone presenting the basic information on the study as well as using sign language for the questions) which could have been played at each of the venues. This would have allowed for the use of a single sign language presenter resulting in a more standardised presentation of questions.

References

- Adenuga, B. A. 2009. "HIV/AIDS Knowledge of Secondary School Learners in Sefhare, Botswana." Master's dissertation, University of South Africa.
- Aderemi, T. J., B. J. Pillay, and T. M. Esterhuizen. 2013a. "Differences in HIV Knowledge and Sexual Practices of Learners with Intellectual Disabilities and Non-Disabled Learners in Nigeria." *Journal of the International AIDS Society* 16 (1): 17331. <https://doi.org/10.7448/IAS.16.1.17331>.
- Aderemi, T. J., B. J. Pillay, and T. M. Esterhuizen. 2013b. "Individual and Socio-Cultural Factors Contributing to the Spread of HIV and the AIDS Pandemic among Adolescents: A Socio-Educative Perspective." *Journal of the International AIDS Society* 16:1–9.
- Bell, D. 2013. "Investigating Teaching and Learning Support for Students with Hearing Impairment at a University in the Western Cape." PhD thesis, University of Stellenbosch.
- Borg, S. 2009. "English Language Teachers' Conception of Research." *Applied Linguistics* 33 (3): 358–88. <https://doi.org/10.1093/applin/amp007>.
- Case, K. K., P. D. Ghys, E. Gouws, J. W. Eaton, A. Borquez, J. Stover, P. Cuci, L. L. J. Abu-Radaad, G. P. Garnett, and T. B. Hallet. 2012. "Understanding the Modes of Transmission Model of New HIV Infection and its Role in Prevention Planning." *Bulletin of the World Health Organization* 90:831–8. <https://doi.org/10.2471/BLT.12.102574>.
- Chireshe, R., E. N. Rutondoki, and P. Ojwang. 2010. "Perceptions of the Availability and Effectiveness of HIV/AIDS Awareness and Intervention Programmes by People with Disabilities in Uganda." *Journal of Social Aspects of HIV/AIDS* 7:17–23. <https://doi.org/10.1080/17290376.2010.9724973>.

- Department of Basic Education. 2011. "Curriculum and Assessment Policy Statements (CAPS). 2011. Accessed 20 April 2014.
[https://www.education.gov.za/Curriculum/CurriculumAssessmentPolicyStatements\(CAPS\).aspx](https://www.education.gov.za/Curriculum/CurriculumAssessmentPolicyStatements(CAPS).aspx).
- De Andrade, V., and B. Baloyi. 2011. "HIV/AIDS Knowledge among Adolescent Sign Language Users in South Africa." *African Journal of AIDS Research* 9:307–13.
<https://doi.org/10.2989/16085906.2010.530189>.
- Eide, A. H., C. Schür, C. Ranchod, P. Rohleder, L. Swartz, and M. Schneider. 2011. "Disabled persons' Knowledge of HIV Prevention and Access to Health Care Prevention Services in South Africa." *AIDS Care: Psychological and Socio-Medical Aspects of AIDS/HIV* 23:1595–601. <https://doi.org/10.1080/09540121.2011.575119>.
- Eriksson, E., G. Lindmark, P. Axemo, B. Haddad, and B. M. Ahlberg. 2013. "Faith, Premarital Sex and Relationships: Are Church Messages in Accordance with the Perceived Realities of the Youth? A Qualitative Study in KwaZulu-Natal, South Africa." *Journal of Religious Health* 52:454–66. <https://doi.org/10.1007/s10943-011-9491-7>.
- Goldstein, M. F., E. A. Eckhardt, P. Joyner-Creamer, R. Berry, H. Paradise, and C. M. Cleland. 2010. "What do Deaf High School Students Know about HIV?" *AIDS Education and Prevention* 22:523–37. <https://doi.org/10.1521/aeap.2010.22.6.523>.
- Hanass-Hancock, J., I. Regondi, and K. Naidoo. 2013. "Disability and HIV: What Drives this Relationship in Eastern and Southern Africa?" *African Journal of Disability* 2 (1): 6. <https://doi.org/10.4102/ajod.v2i1.25>.
- Harrison, A., M. Newell, J. Imrie, and G. Hoddinott. 2010. "HIV Prevention for South African Youth: Which Interventions Work? A Systematic Review of Current Evidence." *BMC Public Health* 10 (102): 1–12. <https://doi.org/10.1186/1471-2458-10-102>.
- Mall, S. 2012. "HIV Prevention Issues for Deaf and Hard of Hearing Adolescents: Views of Parents, Teachers, Adolescents and Organizations Serving the Deaf Community." PhD thesis, University of Stellenbosch.
- Mall, S., and L. Swartz. 2012. "Perceptions of Educators of Deaf and Hard-of-Hearing Adolescents of HIV-Risk Factors for these Youths." *African Journal of Aids Research* 11 (4): 343–8. <https://doi.org/10.2989/16085906.2012.754834>.
- Maluleke, T. X. 2010. "Sexual Risk Behaviour amongst Young People in the Vhembe District in the Limpopo Province, South Africa." *Health SA–Gesondheid* 15 (1). <https://doi.org/10.4102/hsag.v15i1.505>.
- Marx, E. M., M. E. Soer, and A. L. Dick. 2011. "The Ability of Adolescents with Hearing Loss in Special Schools to Access and Use Academic Material in Three Provinces in South Africa." *Mousaion* 29 (1): 37–55.

- Mudingayi, A., P. Lutala, and B. Mupenda. 2011. "HIV Knowledge and Sexual Risk Behaviour among Street Adolescents in Rehabilitation Centres in Kinshasa; DRC: Gender Differences." *PanAfrican Medical Journal* 10 (23): 1–17.
<https://doi.org/10.4314/pamj.v10i0.72233>.
- Mukolo, A., M. B. Blevins, L. B. Victor, L. Vaz, M. E. Sidat, and A. Vergara. 2013. "Correlates of Social Exclusion and Negative Labelling and Devaluation of People Living with HIV/AIDS in Rural Settings: Evidence from a General Household Survey in Zambezia Province, Mozambique." *PLoS One* 8 (10): 1–12.
<https://doi.org/10.1371/journal.pone.0075744>.
- Nkansah-Amankra, S., A. Diedhiou, H. Agbanu, C. Harrod, and A. Dhawan. 2011. "Correlates of Sexual Risk Behaviors among High School Students in Colorado: Analysis and Implications for School-Based HIV/AIDS Programs." *Maternal and Child Health Journal* 15:730–41. <https://doi.org/10.1007/s10995-010-0634-3>.
- Polit, D. F., and C. T. Beck. 2012. *Nursing Research: Generating and Assessing Evidence for Nursing Practice*. 9th ed. Philadelphia: Lippincott Williams and Wilkins.
- Rohleder, P., A. H. Eide, L. Swartz, C. Ranchod, M. Schneider, and C. Schur. 2012. "Gender Differences in HIV Knowledge and Unsafe Sexual Behaviours among Disabled People in South Africa." *Disability and Rehabilitation* 34 (7): 605–10.
<https://doi.org/10.3109/09638288.2011.599915>.
- Scheier, D. B. 2009. "Barriers to Healthcare for People with Hearing Loss: A Review of Literature." *Journal of the New York State Nurses Association* 40 (1): 4–10.
- Sekaran, U., and R. Bougie. 2009. *Research Methods for Business: A Skill Building Approach*. 5th ed. West Sussex: John Wiley.
- Srivastava, A., S. E. Mahmood, P. Mishra, V. P. Shrotriya, and I. Shaifali. 2011. "Adolescence Awareness: A Better Tool to Combat HIV/AIDS." *National Journal of Community Medicine* 2 (1): 86–91.
- Touko, A., C. P. Mboua, P. M. Tohmuntain, and A. B. Perrot. 2010. "Sexual Vulnerability and HIV Seroprevalence among the Deaf and Hearing Impaired in Cameroon." *Journal of the International AIDS Society* 13 (5). <https://doi.org/10.1186/1758-2652-13-5>.
- UNAIDS. 2014. "The Gap Report." Accessed 12 July 2017.
http://www.unaids.org/sites/default/files/media_asset/UNAIDS_Gap_report_en.pdf.
- UNAIDS. 2015. "Fact Sheet." Accessed 11 July 2017.
http://www.unaids.org/sites/default/files/media_asset/20150901_FactSheet_2015_en.pdf.

Zuma, K., G. Setswe, T. Ketye, T. Mzolo, T. Rehle, and N. Mbelle. 2010." Age at Sexual Debut: A Determinant of Multiple Partnership among South African Youth." *African Journal of Reproductive Health* 14 (2): 47–54.