




Impact of implementing an online interactive educational tool for future HIV “cure” research in an HIV clinic waiting room in Cape Town, South Africa

M. Hendricks, O. Varathan, F. Cassim, M. Kidd & K. Moodley

To cite this article: M. Hendricks, O. Varathan, F. Cassim, M. Kidd & K. Moodley (2020): Impact of implementing an online interactive educational tool for future HIV “cure” research in an HIV clinic waiting room in Cape Town, South Africa, *AIDS Care*, DOI: [10.1080/09540121.2020.1766661](https://doi.org/10.1080/09540121.2020.1766661)

To link to this article: <https://doi.org/10.1080/09540121.2020.1766661>

 View supplementary material 

 Published online: 20 May 2020.


 Submit your article to this journal 

 View related articles 

 View Crossmark data 



Impact of implementing an online interactive educational tool for future HIV “cure” research in an HIV clinic waiting room in Cape Town, South Africa

M. Hendricks^a, O. Varathan^a, F. Cassim^a, M. Kidd ^b and K. Moodley^a

^aCentre for Medical Ethics and Law, Stellenbosch University, Cape Town, South Africa; ^bDepartment of Statistics, Stellenbosch University, Cape Town, South Africa

ABSTRACT

Access to antiretroviral treatment (ART) in South Africa is suboptimal and erratic. For those on treatment, compliance remains a significant challenge. Interruptions to ART have negative implications for the individual and the epidemic. ART is therefore not a sustainable solution and there is an urgent need for a cure. As HIV cure research expands globally, the need to engage community members about cure is becoming a priority. It is vital that potential trial participants understand basic HIV cure research concepts. An online interactive educational tool was co-created with HIV stakeholders to engage and inform HIV research trial participants. The study was conducted with patients at the FAMCRU HIV clinic at Tygerberg Hospital in Cape Town, South Africa. The educational tool comprises two modules that provide information on HIV prevention, treatment and cure research. Participants completed a questionnaire before and after interacting with the programme. There was a significant increase in knowledge scores of participants demonstrated after using the tool. The interactive tool was successful in increasing participants' knowledge of HIV prevention, treatment and cure research.

ARTICLE HISTORY

Received 9 July 2019
Accepted 3 May 2020

KEYWORDS

HIV cure research; education; Audio-visual aids; Multi-media programme; patient participation; interactive tool; HIV knowledge

Introduction

South Africa has the largest population of HIV infected individuals globally, estimated at 7.97 million with 62% of the infected population receiving antiretroviral therapy (ART) in 2019. Effective treatment of chronic diseases, such as HIV, combined with health education, promotes patient self-management (Kamimura et al., 2017). Due to side effects, suboptimal compliance and resistance, lifelong anti-retroviral treatment is not a sustainable solution. Although cure strategies are important HIV cure research trials often involve potentially high risk interventions (Dubé et al., 2019) and study participants should be aware of potential risks. Limited inquiry has been aimed at understanding the needs, motivation and perceptions of people living with HIV recruited to join remission/cure research studies. Informed consent in HIV cure research is challenged by information disclosure to potential participants and understanding cure science strategies (Bromwich & Millum, 2017).

Waiting rooms in healthcare settings are an opportune environment to engage with patients, parents, caregivers and family members to share information informally.

Conventional methods for patient education include pamphlets, posters and bulletin boards however, new

approaches such as video and computer multimedia programmes are associated with improved patient knowledge, engagement in care (Reid et al., 2017). Positive feedback from participants in other studies suggests that multimedia education is a favourable supplement to conventional written and face-to-face trial information and can be understood by adolescents and parents (Michalski et al., 2016). HIV research studies in resource limited settings often enrol volunteers with limited understanding of medical research (Afolabi et al., 2015; Staunton et al., 2018). This supports science translation and educational tool development.

Our study team developed an interactive educational tool for use by patients and caregivers at the FAMCRU clinic at Tygerberg hospital. The clinic receives HIV positive patients and research participants daily. Participants, usually children, are accompanied by their parents or caregivers and wait long hours before consulting with healthcare providers or study investigators. In an effort to increase engagement with patients, research participants, parents and caregivers, the tool was developed to discuss treatment, prevention and unintended implications of HIV cure research. The aim of the study was to assess the efficacy of the educational tool in improving HIV understanding.

CONTACT K. Moodley  km@sun.ac.za

Supplemental data for this article can be accessed <https://doi.org/10.1080/09540121.2020.1766661>.

© 2020 Stellenbosch University

Methods

Study design

The efficacy of the online tool was assessed using an uncontrolled quasi-experimental study, namely the “one group pre-test–post-test design”. The pre-test measurement served as a control “group”. Participants completed a questionnaire comprising multiple choice questions, before and immediately after completing the online interactive programme. The questionnaire comprised 10 true and false questions testing basic information on HIV prevention, treatment and cure research and was pilot tested on 10 participants prior to the study. It assessed whether the modules improved basic knowledge by comparing scores before and after exposure to the interactive tool. The questionnaire was based on information provided throughout the online modules and tested understanding of concepts. Questions were developed in consultation with Community Advisory Board (CAB) members. A similar questionnaire was used when engaging Grade 9 high school learners during a HIV educational workshop.

Interactive educational tool module content

POWTOON software for animation creation was used to develop the content of the tool. SCORM- Ispring solutions was used to generate the questionnaire. Each module comprises information on HIV and a short video followed by a few questions. Module one comprises animations on HIV prevention and treatment research, pre-exposure prophylaxis (PreP) and HIV vaccine trials. Module two looks at HIV cure research (CD4 cells, viral suppression), and early treatment: the Mississippi baby, the South African patient and the Berlin patient.

Modules comprise simple explanation of terminology, tips on prevention and information on cure research.

Each module is 10–15 min long, requiring a total participation time of approximately 30 min. The online platform was set-up in two booths on touchscreen computers, mounted on an immobile kiosk for security and confidentiality purposes. Participants were provided with an introduction to the programme and were allowed to work through it at their own pace. They were required to complete a questionnaire before and after interaction with the programme. Language proficiency and literacy of participants were considered throughout. Each answer scored one mark out of a potential 10 marks. The tool is by nature interactive as certain prompts need to be heeded and questions correctly answered along the way to progress to completion. These questions are aimed at testing whether basic

concepts have been understood before progressing to additional information.

Input from CAB members and clinic health care providers at the FAMCRU Clinic was obtained as part of a community engagement process to ensure that the content and mode of delivery was relevant and appropriate. The tool forms part of a comprehensive community engagement strategy.

Recruitment

Healthcare workers at the clinic informed potential volunteers about the study. If they were keen to engage with the online tool, a field worker trained on the tool, discussed it with them first. The study population included adult patients or parents/caregivers of patients and were 18 years or older. Fifty-one (51) study participants were recruited from the waiting room.

Data Collection and statistical analysis

Data collection occurred at the clinic between 18 April and 9 May 2018. Testing for possible significant change in average knowledge scores between pre- and post-testing periods was conducted using mixed-model repeated measures analysis of variance (ANOVA).

Ethics approval was obtained from the Health Research Ethics Committee (HREC) at Stellenbosch University (N3/05/063) and institutional approval was also obtained. Participants provided written informed consent before engaging with the online platform. Headphones and a touch screen computer were located in a kiosk to maintain privacy. Participants received a R50 (US\$ 3) voucher for time and inconvenience as prescribed by national ethics guidance. This was in addition to reimbursement for travel for other studies.

Results

Demographic details

Fifty one participants were recruited. The study population had a median age of 25.0 years with 91% females and 9% males. 49% (25) of participants completed grades 11–12 as their highest level of education; 47% (24) completed grades 7–10; 2% (1) had tertiary education while 2% (1) completed grade 1. Home language selected was Afrikaans for 43% (22), English and isiXhosa for 22% (11), isiXhosa for 16% (8), and English for 12% (6). 63% of the participants were unemployed, 30% worked part-time and 7% were in fulltime employment.

Knowledge Scores

Figure 1 shows a significant improvement ($p = 0.0006$) in scores of the questionnaire taken before and after using

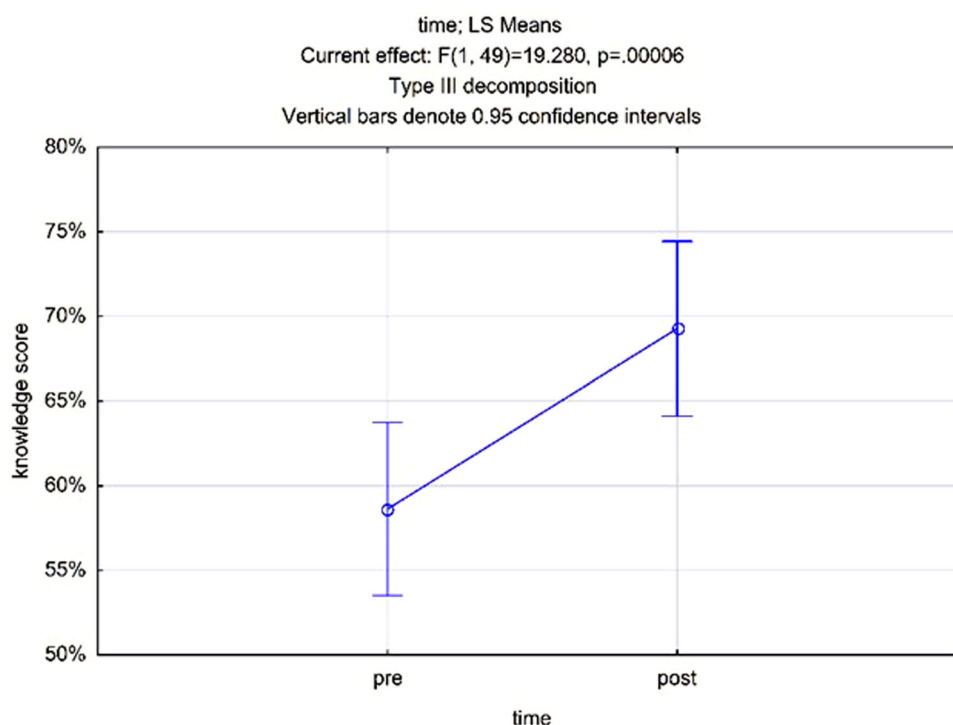


Figure 1. Knowledge scores before and after use of the interactive tool. Vertical bars denote 0.95 confidence interval. The x axis displays the time of the test as either pre-test or post-test. The y axis displays the knowledge score in percentage.

the interactive tool. The increase in knowledge score was from 57% pre-test to 68% post-test.

Discussion

The results indicate that the online interactive tool was effective in increasing knowledge of key concepts related to HIV prevention, treatment and cure amongst study participants. These findings are consistent with results of similar studies conducted in South Africa where the use of multimedia tools such as videos had a measurable and beneficial impact on improving patient/participant knowledge (Matthews et al., 2002; Wong et al., 2006). Our results concur with international studies using multimedia tools to more adequately inform and educate study participants on research studies (Afolabi et al., 2015; Jimison et al., 1998; Joseph et al., 2006; Kraft et al., 2017; Michalski et al., 2016; Siu et al., 2016; Weston et al., 1997).

A quasi-experimental pre-test post-test design was implemented in this study due to the short study duration and small sample size. With the pre-test and post-tests being conducted immediately before and after interaction with the online tool, the potential impact of confounding factors was limited. The correct answers to questions in the questionnaires were provided to study participants at the end of this study to ensure that they left with accurate information.

Higher levels of education of participants may improve their ability to engage with an intervention and to have a better understanding of module content. This was seen in our study where the majority of study participants had their highest levels of education as grade 10 or higher. This enabled participants to better comprehend and retain information. These results concurred with findings in other studies demonstrating effectivity of multimedia interactive tools with higher levels of education (Erlen, 2010; Flory & Emanuel, 2004; Joseph et al., 2006). Multimedia interventions using mobile technology have been used in waiting rooms similar to ours (Reychav et al., 2018). Educational videos have been effectively used in various clinics to provide parents and children with an interactive learning experience about sickle cell disease (Leong et al., 2018). In this study, the waiting room was an ideal space to engage and interact with participants as they had long waiting hours. Having two separate computer kiosks allowed for simultaneous participation. The primary benefit of the study to participants is increased knowledge about HIV prevention, treatment, and cure research. Although the language used in the interactive tools and questionnaire (English) was not the first language of 59% of participants, they were all able to read and understand English. Translation into other languages may have resulted in higher knowledge scores. However, with multiple official languages in South Africa

this was not a feasible option. Study participants were predominantly female as these are the caregivers who usually bring their children to the clinic for treatment or research purposes.

Conclusion

In this study the interactive educational tool was successful in increasing participants' knowledge of HIV cure research. It is an effective method for stakeholder engagement in hospital waiting rooms. This tool could also be used to enhance consent processes in future cure research in similar settings.

Acknowledgements

The authors would like to acknowledge Tygerberg Hospital, in particular the FAMCRU Clinic for supporting the project. The authors thank all the study participants. MH conducted interviews, analysed data, and was responsible for drafting the article and revised all subsequent editions. OV conducted a literature review and drafted sections of the article. FC created the POWTOONS animations for the online interactive tools. She commented on the draft version of the article. MK was responsible for statistical analysis and commented on all drafts of the article. KM is the Principal Investigator of the project and provided general oversight. She was involved in designing the study, supervising the development of module content and editing the article.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

NIH/NIAID grant (R01A108366-01: 'Unintended and Intended Implications of HIV Cure: A Social and Ethical Analysis'). The Working Group's composition and rationale is explained at <http://searchiv.web.unc.edu/>.

ORCID

M. Kidd  <http://orcid.org/0000-0002-4887-7296>

References

- Afolabi, M. O., McGrath, N., D'Alessandro, U., Kampmann, B., Imoukhuede, E. B., Ravinetto, R. M., Alexander, N., Larson, H. J., Chandramohan, D., & Bojang, K. (2015). A multimedia consent tool for research participants in the Gambia: A randomized controlled trial. *Bulletin of the World Health Organization*, 93(5), 320–328A. <https://doi.org/10.2471/BLT.14.146159>
- Bromwich, D., & Millum, J. R. (2017). Informed consent to HIV cure research. *Journal of Medical Ethics*, 43(2), 108–113. <https://doi.org/10.1136/medethics-2015-103122>
- Dubé, K., Barr, L., Palm, D., Brown, B., & Taylor, J. (2019). Putting participants at the centre of HIV cure research. *The Lancet. HIV*, 3018(19), 1–2. <https://doi.org/10.1016/S2352-3018>
- Erlen, J. A. (2010). Informed consent: Revisiting the issues. *Orthopaedic Nursing*, 29(4), 276–280. <https://doi.org/10.1097/NOR.0b013e3181e517f1>
- Flory, J., & Emanuel, E. (2004). Interventions to improve research in informed consent for research. *JAMA*, 292(13), 1593–1601. <https://doi.org/10.1001/jama.292.13.1593>
- Jimison, H. B., Sher, P. P., Appleyard, R., & Levernois, Y. (1998). The use of multimedia in the informed consent process. *Journal of the American Medical Informatics Association*, 5(3), 245–256. <https://doi.org/10.1136/jamia.1998.0050245>
- Joseph, P., Schackman, B. R., Horwitz, R., Nerette, S., Verdier, R. I., & Dorsainvil, D. (2006). The use of an educational video during informed consent in an HIV clinical trial in Haiti. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, 42(5), 588–591. <https://doi.org/10.1097/01.qai.0000229998.59869.05>
- Kamimura, A., Tabler, J., Myers, K., Ahmed, F., Aguilera, G., & Ashby, J. (2017). Student-led health education programmes in the waiting room of a free clinic for uninsured patients. *Health Education Journal*, 76(3), 282–292. <https://doi.org/10.1177/0017896916671761>
- Kraft, S. A., Constantine, M., Magnus, D., Porter, K. M., Soo, S., Lee, J., Green, M., Kass, N., Wilfond, B., & Cho, M. (2017). A randomized study of multimedia informational aids for research on medical practices: Implications for informed consent. *Clinical Trials: Journal of the Society for Clinical Trials*, 14(1), 94–102. <https://doi.org/10.1177/1740774516669352>
- Leong, Z. A., Horn, M. S., Thaniel, L., & Meier, E. (2018, April 21–26). Inspiring AWE : Transforming clinic waiting rooms into informal learning environments with active waiting education. *Proc of CHI*, Montreal, Canada.
- Matthews, C., Guttmacher, S. J., Coetzee, N., Magwaza, S., Stein, J., Lombard, C., Goldstein, S., & Coetzee, D. (2002). Evaluation of a video based health education strategy to improve sexually transmitted disease partner notification in South Africa. *Sexually Transmitted Infections*, 78(1), 53–57. <https://doi.org/10.1136/sti.78.1.53>
- Michalski, A., Stopa, M., & Miśkowiak, B. (2016). Use of multimedia technology in the doctor-patient relationship for obtaining patient informed consent. *Medical Science Monitor*, 22, 3994–3999. <https://doi.org/10.12659/MSM.894147>
- Reid, S., Neto, G., Tse, S., Farion, K. J., Marvizi, A., Smith, L., Clarkin, C., Rohde, K., & Moreau, K. (2017). Education in the waiting room: Description of a pediatric emergency department educational initiative. *Pediatric Emergency Care*, 33(10), e87–e91. <https://doi.org/10.1097/PEC.0000000000001140>
- Reychav, I., Parush, A., McHaney, R., Hazan, M., & Moshonov, R. (2018). The use of mobile technology in waiting rooms to leverage women's empowerment: A conceptual context. *Health Informatics Journal*, 24(3), 277–292. <https://doi.org/10.1177/1460458216671561>

- Siu, J. M., Rotenberg, B. W., Franklin, J. H., & Sowerby, L. J. (2016). Multimedia in the informed consent process for endoscopic sinus surgery: A randomized control trial. *The Laryngoscope*, 126(6), 1273–1278. <https://doi.org/10.1002/lary.25793>
- Staunton, C., de Roubaix, M., Baatjies, D., Black, G., Hendricks, M., Rossouw, T., & Moodley, K. (2018). Ethical challenges in developing an educational video to empower potential participants during consent processes in HIV cure research in South Africa. *Journal of Virus Eradication*, 4(2), 99–102.
- Weston, J., Hannah, M., & Downes, J. (1997). Evaluating the benefits of a patient information video during the informed consent process. *Patient Education and Counseling*, 30(3), 239–245. [https://doi.org/10.1016/S0738-3991\(96\)00968-8](https://doi.org/10.1016/S0738-3991(96)00968-8)
- Wong, I. Y., Lawrence N, V., Struthers, H., McIntyre, J., & Friedland, G. H. (2006). Development and assessment of an innovative culturally sensitive educational videotape to improve adherence to highly active antiretroviral therapy in Soweto, South Africa. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, 43(SUPPL. 1), S142–S148. <https://doi.org/10.1097/01.qai.0000248345.02760.03>