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EDUCATION AND TRAINING

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Evaluation of a knowledge translation intervention for HIV and rehabilitation advocacy in physiotherapy in three sub-Saharan African countries

Hellen Myezwa[a], Stephanie Nixon[b], Joanne Potterton[a], Adedayo Tunde Ajidahun[a], Cathy Cameron[b], Moses Konje[c], Florence Omoroh[c], Brian Chanda Chiluba[d], Theresa Chisoso[d] and Patricia Solomon[e]

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ABSTRACT

Purpose: To evaluate a knowledge translation intervention to determine knowledge, attitudes and self-efficacy related to HIV and rehabilitation advocacy in physiotherapy students.

Methods: A pre and post-test study was conducted at three physiotherapy-training programs in Sub Saharan Africa – the University of the Witwatersrand (Wits), the University of Zambia (UNZA) and Kenya Medical Technical College (KMTC). For each site, the knowledge, attitude and self-efficacy of physiotherapy students were tested pre- and post-intervention using a standardized questionnaire.

Results: Students' knowledge improved with regard to being able to describe the challenges faced by their patients, knowing what resources are available and understanding their role as an advocate. In terms of self-efficacy, they felt more confident clinically, as well as being a resource person to colleagues and an advocate for their patients.

Conclusion:: This study highlights the need to contextualize knowledge translation interventions to meet the unique needs of individual academic sites. Students who have clinical experience working with people living with HIV are more likely to embrace their role as advocates in the area of HIV and rehabilitation.

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IMPLICATIONS FOR REHABILITATION

- The knowledge translation process used in this study gives a concrete example of how to use research evidence on HIV knowledge in rehabilitation applied within the advocacy process.
- Applying the principles of advocacy translates to understanding the management of HIV practically.
- Clinical experience in managing people living with HIV strengthens knowledge and improves the attitude of physiotherapy students
- Physiotherapy students need guidance in realizing their potential as advocates for holistic rehabilitation care for people living with HIV.

Introduction

Students' role and education in advocacy have typically been approached in a piecemeal fashion and as a peripheral subject in health despite being viewed as a key competency in healthcare professional training [1]. How advocacy is taught varies across disciplines and may include promoting student service learning, advocacy initiatives, community-based practice, observation, experience, and reflective practice [1]. Advocacy is considered a tool for awareness promotion. The use of advocacy highlights the value of healthcare practitioners to the healthcare system, fellow healthcare workers and importantly, the patient, family and community [2]. The use of advocacy as a tool aligns with the need to translate knowledge in the clinical space and in managing many health-related conditions.

One of these conditions is HIV. HIV/AIDS is a public health concern in Sub-Saharan Africa. Of the 38.4 million people living with HIV globally, 10.7 million are from South Africa, Zambia and Kenya. The UNAIDS 2020 data reports that 19.1%, 11.1%, and 4.2% of adults living in South Africa, Zambia, and Kenya live with HIV [3]. Physiotherapy students are involved in the management and treatment of people living with HIV (PLHIV), whether as a comorbidity or primary condition [4]. The extensive efforts in the 90:90:90 now 95:95:95 strategy aim to ensure that 90% of people know their HIV status, 90% of PLHIV receive antiretroviral therapy (ART), and 90% of people on ART remain virally suppressed to eradicate HIV by 2020, has succeeded in improving the longevity of PLHIV [5]. Bajunirwe et al. [6] note a myriad of challenges in rural settings that impact access to and availability of care. People with HIV, therefore, continue to experience a disability that requires a comprehensive and mainstream rehabilitation service.

HIV rehabilitation has been included in the curricula for healthcare workers, including physiotherapists, for over a decade [7]. Despite this, knowledge translation (KT) continues to need enhancement. Knowledge Translation is defined "as a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve health and provide more effective health services and products and strengthen the health care system" [8]. Ensuring that KT starts with the student may close the gap between what is taught and

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what is practised. Promoting the knowledge, attitude and skills in advocacy among students is a novel approach to KT. A health advocate "works collaboratively to identify, respond to and promote the health needs and concerns of individual clients, populations, and communities" [9]. In this study, we sought to use a context-specific, appropriate and flexible knowledge translation approach. The approach was underpinned by the use of HIV knowledge supported by the "Sub-Saharan Africa e-module" (ssa.hivandrehab.ca) on HIV and advocacy. The advocacy model proposed intervention at both the patient and system level and used the trainer model. In this model, practitioners are encouraged to target an advocacy need and respond by implementing an advocacy competency to address needs, plan, implement, use appropriate networks and stakeholders, evaluate and provide feedback [10]. Additionally, the advocacy model encouraged a distinction of levels of advocacy, namely client/student, health system, and community levels. The effect of advocacy also underscored empowerment or protective outcomes [11].

A realist evaluation framework provides a systematic and theory-driven approach to studying the influence of context and mechanisms on outcomes [12]. This realist approach is well-suited for KT science [13] and the evaluation of the implementation of new interventions [14]. Our aim was to implement this intervention in all identified rehabilitation programs in Sub-Saharan Africa (SSA), but training contexts throughout the region are extremely diverse. Thus, we rejected a one-size-fits-all approach. To create a flexible intervention, we selected three rehabilitation programs as our study sites, each offering diversity in ways that are relevant to the broader training context in SSA. Taking the realist evaluation approach, each site was encouraged to adapt the KT intervention to best fit their context, then identify mechanisms within and across sites that lead to our outcomes of interest [12–14]. This study allowed us to test the possibility and effectiveness of tailored approaches with the intention to enhance the quality of our advocacy efforts using a common framework of knowledge translation. Our goal in this study was to tailor each physiotherapy programme to adapt and adopt HIV knowledge and advocacy for HIV rehabilitation. We also sought to establish the pre and post knowledge, attitudes, and self-efficacy among students in physiotherapy programmes in advocating for HIV rehabilitation across three sub-Saharan African academic settings.

Methodology

This study utilized a pre and post quantitative test design at three study sites – the University of the Witwatersrand (Wits), University of Zambia (UNZA) and Kenya Medical Technical College (KMTC). The study was approved by the Human Research Ethics Committee at the University of the Witwatersrand (Ref: M180504), the University of Zambia (Ref: 20180409003), University of Toronto (Ref: 35374) and McMaster University (Ref: 4682). Permission was granted by the departments of Physiotherapy at the University of the Witwatersrand, Kenya Medical Training Centre (KMTC/ADM/74/Vol.IV) and the University of Zambia. The specific information on context, implementation plan and method at each study site are outlined below. The three sites were chosen to reflect the diverse contexts in which physiotherapy is taught in Africa. There was an investigator from each site who had an in depth knowledge of the context and physiotherapy curriculum at that institution. All investigators had experience in working in the field of HIV and rehabilitation. The investigators from each site discussed and planned the protocol together. They communicated with colleagues at their institution to achieve buy-in to implementing this project and subsequently managed the data collection process.

Standardized pre-and post-test questionnaires were administered at all three sites to assess knowledge, attitude, and self-efficacy related to HIV rehabilitation. The questionnaire showed moderate to strong internal reliability for each of the component measures, knowledge ($\alpha = 0.72$), attitude ($\alpha = 0.64$) and self-efficacy ($\alpha = 0.79$). The questionnaire was in English as English was the primary language of instruction in all three participating universities. The questionnaires were developed for the project based on the study objectives and were informed by the literature. A realist evaluation framework [13] provided a systematic and theory-driven approach to studying the influence of context and mechanisms on outcomes. This realist approach provided themes under which specific questions were developed. The questionnaire was divided into five sections, focused on demographics, HIV advocacy history, knowledge about HIV advocacy, attitude towards and self-efficacy in working with PLHIV. The items in the knowledge, attitude, and self-efficacy section were Likert scales with response options as strongly agree, agree, undecided, disagree, and strongly disagree. The flowchart of the site-specific data collection process is outlined in Figure 1.

Institution specific methods

University of the Witwatersrand

Wits Physiotherapy department offers a 4-year Bachelor of Science in Physiotherapy and has been in operation since 1921. Wits is a large urban university with 39,000 students and attract students from South Africa predominantly. The focus of the first and second-year curriculum is on basic sciences and physiotherapy skills. In the third and fourth years, the curriculum includes significant physiotherapy theory related to the burden of disease, informed content and related clinical exposure. The clinical blocks take place in various settings, including tertiary academic hospitals, special schools and urban and rural community clinics. Students at Wits are exposed to HIV education across all four years of study. In the first year, general information on HIV pathophysiology is provided. In the second year, students complete assignments that explore HIV in a variety of scenarios. In the third and fourth years, the students are exposed to HIV in relation to various clinical specialities. The teaching and clinical education are focused on the assessment, management and clinical application of HIV. All students are expected to understand the socio-demographic and contextual factors that influence the HIV pandemic, and this is covered across the curriculum. The physiotherapy program at Wits utilizes an evidence-based approach, which involves traditional teaching, e-learning and clinical education. The curriculum includes a student-centred, didactic, practical, and application of case-based learning. The SSA e-module was used as a supplementary resource to support HIV learning across all the clinical specialities.

Site-specific method: At the beginning of the 2019 academic year, third and fourth-year physiotherapy students were invited to attend an information session and lecture on advocacy and rehabilitation for people living with HIV. After the information session, informed consent to participate in the study was obtained from interested students. Students who signed consent completed the pre-questionnaire on knowledge, attitudes and self-efficacy about HIV and advocacy.

Each clinical speciality was encouraged to integrate the e-module in their preclinical lectures. No special curriculum

PRE-TEST	**Number of participants enrolled per site / year of study**	**WITS** Number of students = 95 Number of participants = 74 Year: 3rd and 4th year (beginning of the session)	**KMTC** Number of students = 30 Number of participants = 30 Year: 1st year (beginning of the session)	**UNZA** Number of students = 41 Number of participants =35 Year: 3rd year (beginning of the session)
	Intervention programme per site	• Each clinical speciality was encouraged to integrate the e-module in their preclinical lectures. • No special curriculum programme was developed as HIV was already mainstreamed across the curriculum. • Verbal case presentations (VCP) involving real-life patients and actual scenarios. • Four of the six clinical rotations (public health, paediatrics, cardiopulmonary and neurology) required the students to identify a person living with HIV or a project involving HIV and include advocacy in their management plan.	• HIV was incorporated in biological sciences, behavioural sciences, rehabilitative science and therapeutic science modules. • Case scenarios with specific objectives were developed for use during the knowledge translation (KT) program. • Programme was restructured the teaching and learning approach and adopted interactive lectures, group and plenary discussions. • Students were sent for three weeks of clinical placement in the health facilities within the community, comprehensive care centres and disability assessment program.	• SSA e-module was shared with clinical educators to prepare learning material tailored to their clinical blocks. • One-day workshop was used to expose the students to HIV knowledge and advocacy.
	Outcome measures	Demographic characteristics: Age, gender, year of study HIV advocacy history Knowledge about HIV advocacy Attitudes towards working with PLHIV Self-efficacy in working with people living with HIV		
POST-TEST	**Number of participants enrolled per site / year of study**	**WITS** Number of students =95 Number of participants =67 Year: 3rd and 4th years (end of the session)	**KMTC** Number of students = 29 Number of participants =29 Year: 1st year (end of the session)	**UNZA** Number of students = 33 Number of participants=33 Year: 3rd year (end of the session)
	Outcome measures	Demographic characteristics: Age, gender, year of study Knowledge about HIV advocacy Attitudes towards working with PLHIV Self-efficacy in working with people living with HIV		

Figure 1. Flowchart of the site-specific data collection process.

programme was developed as HIV was already mainstreamed across the curriculum. As part of their clinical placements, students are required to conduct and present verbal case presentations. The cases involve real-life patients and actual scenarios that require intervention or management for a patient or project.

By the beginning of the third year, students have received appropriate background knowledge, including the pathophysiology, aetiology and management of HIV. Resources for use were underscored to the students, and these included the use of evidence-based literature and the e-module. Four of the six clinical rotations (public health, paediatrics, cardiopulmonary and neurology) required the students to identify a patient infected with HIV or a project involving HIV and include advocacy in their management plan. When students had completed all their clinical rotations at the end of the year, they completed the post-questionnaire.

Kenya medical training college

Kenya Medical Training College (KMTC) was started in 1927 at Nairobi Campus, and currently has 68 campuses nationwide. KMTC Homa Bay Campus was established in 1979 and offers diploma courses in clinical medicine, nursing, physiotherapy, and nutrition & dietetics. The physiotherapy program at Homa Bay Campus began in 2014 and involves coursework and clinical practice over three years on a full-time basis. The course is structured so that students develop and build on theory and skills gained in previous years. A student-centred learning approach is applied with an emphasis on interactive lectures and group discussions. The physiotherapy curriculum has an HIV/AIDS & STI module in the first year, which is interdisciplinary and covers HIV units theoretically in the following areas: fundamentals of HIV and AIDS, HIV counselling and testing, HIV treatment and monitoring, management of opportunistic infections, and prevention of HIV infection. Customization of the HIV/AIDS & STI syllabus was undertaken to include the SSA e-module. Stakeholders were involved in the formulation of the content and duration of the course. The customized syllabus had 70 teaching and learning hours (Theory- 46 h and Practical – 24 h). The campus staff were oriented to the SSA e-module.

Site-specific method: Necessary teaching and learning materials to facilitate the program was purchased by the department. First-year students were identified by the facilitators to participate and were introduced to the programme. All 30 first-year students showed interest in the project, gave informed consent and completed the pre-test survey in October 2018.

Case scenarios with specific objectives were developed for use during the knowledge translation (KT) program. The students experienced difficulty comprehending and participating in the initial problem-based learning sessions. Realizing the challenge, the department restructured the teaching and learning approach and adopted interactive lectures, and group and plenary discussions. HIV was also incorporated into biological sciences, behavioural sciences, rehabilitative science and therapeutic science modules to enhance students' understanding.

After completing the customized HIV and Rehabilitation syllabus, the students were sent for three weeks of clinical placement in the health facilities within the community, comprehensive care centres and disability assessment program. At the end of the first year, the students were tested on knowledge, skills, attitudes & advocacy by completing the post-test survey in June 2019.

University of Zambia

The Department of Physiotherapy at the University of Zambia (UNZA) is housed in the School of Health Sciences and was established in 2001, having its first cohort of graduates in 2004. To date, the department has trained 272 undergraduate students.

Site-specific method: The SSA e-module was shared with clinical educators to prepare learning material tailored to their clinical blocks (Traumatology, Orthopaedics, Neurology/Paediatric, Respiratory and General). Clinical educators extracted and prepared learning materials tailored to their clinical blocks and delivered learning within the clinical setting. The second-year physiotherapy students were invited to participate in the study because at the time of the study, they had been exposed to clinical rotations. Their clinical placements start in the third year. For the intended cohort of students, a one-day workshop was used to expose them to HIV knowledge and advocacy. During the workshop, clinical educators shared tailored material and clinical experience. The pre-test questionnaire data was collected among the third-year students at the beginning of the 2018 session and the post-test survey was collected at the end of the session which ended in 2020. Data were collected by two trained research assistants.

Data analysis

Data were managed using REDCap, which is a secure web application for building and managing online surveys and databases [15]. All three participating universities uploaded their data on REDCAP. The data was extracted *via* Microsoft excel® and exported to STATAv15 for analysis. The data were summarized using frequencies and percentages for categorical variables (knowledge, attitude, self-efficacy, HIV advocacy history, year of study and gender). Means and the standard deviation were used to summarise the continuous variable (age). One-way ANOVA and Chi-Squared test were used to determine the relationship between the sites of study and demographic characteristics. Stuart Maxwell test which is also referred to as the extended/generalized McNemar's Chi-square test used to determine marginal homogeneity in a 3×3 contingency table [16–18] for knowledge, attitude and self-efficacy pre and post-test in each of the participating institutions. The 5-point Likert scale was collapsed to a 3-point scale where strongly agree and agree = agree, neutral = neutral and strongly disagree and disagree = disagree [19]. The extended McNemar's Chi-square test command in STATA was used for the analysis (https://www.stata.com/stb/stb7/sbe6/mcc3i.hlp). We hypothesize (H_0) that there will be no significant difference in the knowledge, attitude, and self-efficacy among the students post the educational intervention.

Results

Socio-demographic characteristics and HIV advocacy history

Pre-test, at the three study sites, 74, 30, and 35 students participated in the study from Wits, KMTC, and UNZA, respectively (Tables 1 and 2). The response rate of the students' pre-test was 78%, 100% and 85% from Wits, KMTC and UNZA respectively. There was no significant difference in the age of the students across the three sites (p-value = 0.06). The sites of the study showed significant association with gender, worked with people living with HIV, know someone personally who is living with HIV,

Table 1. Socio-demographic characteristics.

	University of the Witwatersrand		Kenya Medical Training Center		University of Zambia	
Socio-demographic characteristics	Pre ($n=74$)	Post ($n=67$)	Pre ($n=30$)	Post (29)	Pre ($n=35$)	Post ($n=33$)
Mean age (SD) in years	21.4 (1.8)	22.4 (2.1)	22.2 (1.7)	22.9 (1.8)	22.5 (3.4)	23.4 (3.2)
Gender, *n* (%)						
Female	53 (71.6)	49 (73.1)	8 (26.7)	10 (34.5)	27 (77.1)	22 (68.8)
Male	21 (28.4)	18 (26.9)	22 (73.3)	19 (65.5)	8 (22.9)	10 (31.3)
Program, *n* (%)						
Year 1	–	–	30 (100)	–		
Year 2	–	–	–	29 (100)		
Year 3	33 (44.6)	24 (35.8)	–	–	35 (100)	33 (100)
Year 4	41 (55.4)	43 (64.2)	–	–		

Table 2. HIV advocacy history.

	University of the Witwatersrand		Kenya Medical Training Center		University of Zambia	
HIV advocacy history, *n* (%)	Pre ($n=74$)	Post ($n=67$)	Pre ($n=30$)	Post (29)	Pre ($n=35$)	Post ($n=33$)
Have you ever worked (paid or volunteer) with people living with HIV?						
Yes	41 (56.2)	57 (85.1)	14 (46.7)	14 (48.3)	1 (2.9)	0 (0)
No	32 (43.8)	10 (14.9)	16 (53.3)	15 (51.7)	33 (97.1)	32 (100)
Do you know someone personally (e.g., yourself, a friend, a family member) who is living with HIV?						
Yes	23 (31.1)	32 (47.8)	26 (88.7)	28 (96.6)	18 (51.4)	29 (87.9)
No	51 (68.9)	35 (52.2)	4 (13.3)	1 (3.4)	17 (48.6)	4 (12.1)
Based on the definition of health advocacy above, have you previously been involved in any HIV and rehabilitation related advocacy activities?						
Yes	25 (34.2)	52 (77.6)	9 (30)	20 (69)	5 (14.3)	8 (24.2)
No	48 (65.8)	15 (22.4)	21 (70)	9 (31)	30 (85.7)	25 (75.8)
Are you currently involved in any HIV and Rehabilitation related advocacy activities?						
Yes	4 (5.5)	14 (20.9)	12 (40	25 (86.2)	–	1 (3)
No	69 (94.5)	53 (79.1)	18 (60)	4 (13.8)	35 (100)	32 (97)

involved in any HIV and rehabilitation related to advocacy activities, *p*-value <0.001.

Knowledge about HIV advocacy

The responses to the knowledge section of the questionnaire for all three sites are presented in Table 3.

Students from all three academic sites showed a high level of agreement pre-test in all the knowledge questions except for the question "*I know which resources exist in the community that can help with the health and disability challenges that people living with HIV may experience*". The post-test result showed a significant change in the number of students that now agree with this question (*p*-value <0.05). The University of Zambia students were undecided or disagreed about the question *"I can describe rehabilitation*

Table 3. Knowledge about HIV advocacy.

	Pre ($n=74$)			Post ($n=67$)			Stuart-Maxwell test,
University of the Witwatersrand	Agree	Undecided	Disagree	Agree	Undecided	Disagree	*p*-value
I can describe the health and disability challenges that my patients living with HIV may experience	62 (84.9)	11 (15.1)	0	65 (97)	2 (3)	0	a
I can describe rehabilitation strategies that can be used to manage my patients living with HIV.	52 (71.2)	20 (27.4)	1 (1.4)	61 (91)	6 (9)	0	0.01*
I know which resources exist in the community that can help with the health and disability challenges that people living with HIV may experience.	27 (36.5)	29 (39.2)	18 (24.3)	44 (66.7)	17 (25.8)	5 (7.6)	0.01*
I understand how physical therapists can advocate on behalf of their patients living with HIV to meet their needs beyond the clinical setting.	55 (74.3)	15 (20.3)	4 (5.4)	64 (95.5)	2 (3)	1 (1.5)	0.01*
I understand the broader determinants of health (psychological, biological, social, cultural, and economic) that impact people living with HIV in the community.	69 (93.2)	4 (5.4)	1 (1.4)	66 (98.5)	1 (1.5)	0	0.51
I understand how public policy impacts the health of people living with HIV.	48 (64.9)	17 (35.1)	9 (12.2)	49 (73.1)	16 (23.9)	2 (3)	0.37
	Pre ($n=30$)			Post ($n=29$)			
Kenya Medical Training Center	Agree	Undecided	Disagree	Agree	Undecided	Disagree	
I can describe rehabilitation strategies that can be used to manage my patients living with HIV.	18 (60)	4 (13.3)	8 (26.7)	29 (100)	–	–	0.00*
I know which resources exist in the community that can help with the health and disability challenges that people living with HIV may experience.	13 (43.3)	9 (30)	8 (26.7)	29 (100)	–	–	0.00*
I understand how physical therapists can advocate on behalf of their patients living with HIV to meet their needs beyond the clinical setting.	24 (80)	4 (13.3)	2 (6.7)	29 (100)	–	–	0.05
I understand the broader determinants of health (psychological, biological, social, cultural, and economic) that impact people living with HIV in the community.	27 (90)	1 (3.3)	2 (6.7)	28 (96.6)	1 (3.4)	–	0.37
I understand how public policy impacts the health of people living with HIV.	18 (60)	5 (16.7)	7 (23.3)	28 (96.6)	1 (3.4)	–	0.01*
	Pre ($n=35$)			Post ($n=33$)			
University of Zambia	Agree	Undecided	Disagree	Agree	Undecided	Disagree	
I can describe rehabilitation strategies that can be used to manage my patients living with HIV.	9 (25.7)	15 (42.9)	11 (31.4)	16 (48.5)	11 (33.3)	6 (18.2)	0.20
I know which resources exist in the community that can help with the health and disability challenges that people living with HIV may experience.	6 (17.1)	10 (28.6)	19 (54.3)	11 (33.3)	16 (48.5)	6 (18.2)	0.02
I understand how physical therapists can advocate on behalf of their patients living with HIV to meet their needs beyond the clinical setting.	10 (29.4)	11 (32.4)	13 (38.2)	22 (66.7)	7 (21.2)	4 (12.1)	0.04
I understand the broader determinants of health (psychological, biological, social, cultural, and economic) that impact people living with HIV in the community.	20 (57.1)	7 (20)	8 (22.9)	27 (81.8)	5 (15.2)	1 (3)	0.06
I understand how public policy impacts the health of people living with HIV.	15 (44.1)	12 (35.3)	7 (20.6)	21 (63.6)	7 (21.2)	5 (15.2)	0.46

*p-value < 0.05.
[a]Both variables have identical values of categories.

strategies that can be used to manage my patients living with HIV" pre-test and post-test. The Wits cohort showed a significant change in knowledge in questions related to disability challenges and advocacy, pre and post-test. However, there was no significant change in their knowledge of public policy impacts on people living with HIV. In the KMTC cohort, there was a significant change in the knowledge questions related to disability challenges, advocacy and public policy pre and post-test. There was a significant change pre- and post-test in the UNZA cohort in question-related to disability challenges, advocacy and the availability of resources.

Attitude

Table 4 shows the attitudes toward working with PLHIV for students from all three sites both pre- and post-intervention.

Table 4. Attitude.

	Pre ($n=74$)			Post ($n=67$)			Stuart-Maxwell test,
University of the Witwatersrand	Agree	Undecided	Disagree	Agree	Undecided	Disagree	*p*-value
Being a physical therapist requires me to know about HIV.	74 (100)	0	0	67 (100)	0	0	a
It is important for rehabilitation providers to receive training in HIV.	74 (100)	0	0	67 (100)	0	0	a
I believe that rehabilitation providers have a role in advocating on behalf of their patients living with HIV so that they can access the services they need in the community.	74 (100)	0	0	67 (100)	0	0	a
Working with other health care or service providers can help me better manage my patients living with HIV.	74 (100)	0	0	66 (100)	0	0	a
I feel that rehabilitation providers have a role beyond individual HIV patients to include the broader determinants of health (psychological, biological, social, cultural, and economic).	70 (94.6)	2 (2.7)	2 (2.7)	62 (95.4)	3 (4.6)	0	a
I believe that rehabilitation providers have a role in advocating for population or system-level change related to the needs of people living with HIV.	66 (90.4)	7 (9.6)	0	66 (98.5)	1 (1.5)	0	a
	Pre ($n=30$)			Post ($n=29$)			
Kenya Medical Training Center	Agree	Undecided	Disagree	Agree	Undecided	Disagree	
It is important for rehabilitation providers to receive training in HIV.	30 (100)	–	–	29 (100)	–	–	a
I believe that rehabilitation providers have a role in advocating on behalf of their patients living with HIV so that they can access the services they need in the community.	25 (83.3)	5 (16.7)	–	29 (100)	–	–	a
Working with other health care or service providers can help me better manage my patients living with HIV.	30 (100)	–	–	29 (100)	–	–	a
I feel that rehabilitation providers have a role beyond individual HIV patients to include the broader determinants of health (psychological, biological, social, cultural, and economic).	24 (80)	4 (13.3)	2 (6.7)	29 (100)	–	–	0.05
I believe that rehabilitation providers have a role advocating for population or system level change related to the needs of people living with HIV.	26 (86.7)	3 (10)	1 (3.3)	29 (100)	–	–	0.14
	Pre ($n=35$)			Post ($n=33$)			
University of Zambia	Agree	Undecided	Disagree	Agree	Undecided	Disagree	
It is important for rehabilitation providers to receive training in HIV.	33 (94.3)	2 (5.7)	0 (0)	32 (97)	1 (3)	–	0.23
I believe that rehabilitation providers have a role in advocating on behalf of their patients living with HIV so that they can access the services they need in the community.	31 (93.9)	2 (6.1)	0 (0)	32 (97)	1 (3)	–	0.20
Working with other health care or service providers can help me better manage my patients living with HIV.	33 (94.3)	1 (2.9)	1 (2.9)	31 (96.9)	1 (3.1)	–	0.40
I feel that rehabilitation providers have a role beyond individual HIV patients to include the broader determinants of health (psychological, biological, social, cultural, and economic).	30 (88.2)	4 (11.4)	0 (0)	31 (93.6)	2 (6.1)	–	0.45
I believe that rehabilitation providers have a role in advocating for population or system-level change related to the needs of people living with HIV.	29 (82.9)	4 (11.4)	2 (5.7)	29 (87.9)	3 (9.1)	1 (3)	0.27

*p-value <0.05.
[a]Both variables have identical values of categories.

In all three study sites, the students strongly agreed with all questions on attitude, and this was similar pre- and post-test.

Self-efficacy

The student's sense of self-efficacy in working with people living with HIV is presented in Table 5.

Wits students showed significant change pre and post-test questions related to confidence in clinical skills, being a resource person, confidence in access to information and advocacy skills. KMTC students also showed significant changes in pre and post-test questions related to confidence in clinical skills and being a resource person. At UNZA, there was no significant change in the students' pre and post-test responses to all the self-efficacy measures.

Table 5. Self-efficacy.

	Pre ($n=74$)			Post ($n=66$)			Stuart-Maxwell test,
University of the Witwatersrand	Agree	Undecided	Disagree	Agree	Undecided	Disagree	p-value
†I feel confident that I have the clinical skills I need to provide rehabilitation to people living with HIV.	43 (58.9)	25 (34.2)	5 (6.8)	60 (89.6)	6 (9)	1 (1.5)	0.00*
I can be a resource person for my colleagues regarding rehabilitation interventions for people living with HIV.	41 (55.4)	26 (35.1)	7 (9.5)	55 (82.1)	10 (14.9)	2 (3)	0.01*
I am confident I can facilitate access to community-based support to address the health and disability challenges of my patients living with HIV.	33 (44.6)	32 (43.2)	9 (12.2)	45 (67.2)	20 (29.9)	2 (3)	0.01*
I am confident I can access information to manage the health of my patient's living with HIV beyond clinical intervention.	60 (81.1)	12 (16.2)	2 (2.7)	64 (95.5)	2 (3)	1 (1.5)	0.03*
I feel confident that as a physical therapist I can advocate for change to the broader determinants of health (psychological, biological, social, cultural, and economic) that impact people living with HIV.	56 (75.7)	15 (20.3)	3 (4.1)	58 (87.9)	6 (9.1)	2 (3)	0.28
I am confident that I have the skills to advocate for population or system-level change on behalf of people living with HIV.	37 (50)	30 (40.5)	7 (9.5)	54 (80.6)	11 (16.4)	2 (3)	0.00*
	Pre ($n=30$)			Post ($n=29$)			
Kenya Medical Training Center	Agree	Undecided	Disagree	Agree	Undecided	Disagree	
I can be a resource person for my colleagues about rehabilitation interventions for people living with HIV.	20 (66.7)	5 (16.7)	5 (16.7)	29 (100)	–	–	0.01*
I am confident I can facilitate access to community-based supports to address the health and disability challenges of my patients living with HIV.	20 (66.7)	7 (23.3)	3 (10)	29 (100)	–	–	0.01*
I am confident I can access information to manage the health of my patient's living with HIV beyond clinical intervention.	25 (83.3)	2 (6.7)	3 (10)	29 (100)	–	–	0.08
I feel confident that as a physical therapist I can advocate for change to the broader determinants of health (psychological, biological, social, cultural, and economic) that impact people living with HIV.	25 (83.3)	4 (13.3)	1 (3.3)	29 (100)	–	–	0.08
I am confident that I have the skills to advocate for population or system-level change on behalf of people living with HIV.	16 (53.3)	9 (30)	5 (16.7)	29 (100)	–	–	0.00*
	Pre ($n=35$)			Post ($n=33$)			
University of Zambia	Agree	Undecided	Disagree	Agree	Undecided	Disagree	
I can be a resource person for my colleagues regarding rehabilitation interventions for people living with HIV.	14 (40)	13 (37.1)	8 (22.9)	13 (39.4)	14 (42.4)	6 (18.2)	0.89
I am confident I can facilitate access to community-based support to address the health and disability challenges of my patients living with HIV.	15 (42.9)	8 (22.9)	12 (34.3)	13 (39.4)	14 (42.4)	6 (18.2)	0.20
I am confident I can access information to manage the health of my patient's living with HIV beyond clinical intervention.	16 (48.5)	12 (36.4)	5 (15.2)	23 (69.7)	7 (21.2)	3 (9.1)	0.40
I feel confident that as a physical therapist, I can advocate for change to the broader determinants of health (psychological, biological, social, cultural, and economic) that impact people living with HIV.	24 (68.6)	9 (25.7)	2 (5.7)	24 (72.7)	6 (18.2)	3 (9.1)	0.45
I am confident that I have the skills to advocate for population or system-level change on behalf of people living with HIV.	11 (31.4)	13 (37.1)	11 (31.4)	14 (42.4)	15 (45.5)	4 (12.1)	0.27

*p-value <0.05.

Discussion

The study aimed to tailor knowledge translation for the implementation of HIV rehabilitation and advocacy. Additionally, it aimed to establish the level of knowledge, attitude and practice pre and post-educational intervention. The intervention included evidence-based HIV rehabilitation knowledge and a novel E-Module for SSA to guide evidence-informed practice in HIV and rehabilitation as well as the application of educational principles. The project sought to test what effect the intervention had on attitude and practice and to identify learning from each of the tailor-made programmes. Overall students obtained knowledge from the tailored intervention at each site however the differences in approach at each site influenced the nuance of which areas each group of students experienced change. Factors that were evidently different across sites were the timing of introducing the HIV module and immersion into clinical experience. Students were less knowledgeable about the resources and role of the therapists in advocacy and in the policy application. They also had lower perceived self-efficacy in these areas. These are areas that require experience and systems thinking and it is thus unsurprising that undergraduate students needed intervention before perceiving themselves as efficient in the two areas. More attention needs to be given to making these roles explicit to students from an early stage in their training. The skillset required to be an effective advocate needs to be enhanced and the policies pertaining to HIV and rehabilitation should be highlighted. Specific outcomes in knowledge self-efficacy and attitude are discussed.

Knowledge

The context-based and tailored programmes aimed to improve knowledge translation and advocacy as a tool among physiotherapy students in their contribution and management of people living with HIV. The E-module intervention made a statistically significant difference in the students' understanding of health-related challenges experienced by people living with HIV in two out of the three academic programs that participated in this study. At KMTC and Wits, the students indicated they already had an appreciation of these issues before the intervention and indicated a high understanding. One reason that could have contributed to a difference in the level of knowledge of the students in the different academic programs is the level of training and the exposure to the clinical platform. In KMTC, the students were in the early part of training; thus, comprehending the case study was a challenge. While in UNZA, students had exposure to clinical practice and integrating the case study was effective. Therefore, one can conclude that the test of knowledge remained theoretical for students who were not immersed in the clinical platform. Early and frequent clinical education has been shown to enhance knowledge, attitudes, and clinical skills [20,21].

Students at Wits and UNZA reported a better understanding of the available resources in the health sector and community level to assist them with advocacy and addressing patient challenges post-intervention. Availability and awareness of advocacy resources are considered important tenets of success in health worker advocacy and should be actively surfaced for practitioners and students [11]. The students at Wits reported skills enhancement in that they understand how to advocate for their patients living with HIV to meet their needs beyond the clinical setting. Again, the difference in these results between the universities could be related to the level of training and clinical exposure. In the case where students reported and showed statistically significant results, students had spent four weeks in the clinical setting and were expected to complete a real-world task involving assessment, treatment and identification of advocacy needs, implementation of advocacy competency and activities, and reflection on the outcomes of the task. This speaks to the debate about how advocacy should be taught, formal or informal or theoretical to practical [1].

Self-efficacy

Self-efficacy is a measure of the student's ability to assess their competence to perform a particular set of skills and tasks [22]. Similar to the area of knowledge in HIV and HIV advocacy, Wits and KMTC showed a significant change post-test in perceived levels of self-efficacy in students' ability to advocate. The reasons are possibly the same in that the true test of one's ability to advocate can only be perceived if there is a real case in a real-world situation. In the Zambian context, an interesting scenario emerged, there was a shift in the number of students who felt they had self-efficacy before the training, and post-exposure, they reported being undecided (UNZA). A plausible reason for their indecision could be that the context and the learning design at UNZA were forced to change due to student protests within the university. They used a paper-based case which perhaps was not considered to be a true, real-life context and therefore did not provide an opportunity for students to feel they could judge their self-efficacy. Thomas et al. [23] proposed that theory is important in the progression of knowledge translation. One of the theories that are proposed as useful in implementing knowledge translation is the social constructivist theory. In this theory, knowledge is considered dynamic and is a product of human interaction and making meaning of knowledge in a particular context [24]. In the process, the theory of social constructivism promotes the attainment of cognitive processing strategies, problem-solving, and self-regulation. It, therefore, requires student involvement and the use of reflection to advance knowledge. The learning design must take into account the environment, context, and interventions to foster deep learning that calls on the development of appropriate skills, affective learning, and knowledge [23]. Providing students with appropriate and strategic clinical exposure over the course of their training will help develop self-efficacy in the areas required. Students should have time to reflect on their clinical practice and be assisted to identify those skills which may need further enhancement. This is a formative process and time is needed for students to practice and consolidate these skills.

Attitude

All students agreed with all statements on attitude both before and after the training. This may be attributed to the general training in professional practice that students receive. In such courses, the attributes of a health care worker include the correct and unbiased attitude one would have that is human rights-based and free from stigma and personal bias. It is also possible that as all three countries are situated in sub-Saharan Africa, where HIV is endemic with the region being the epi-centre of the HIV pandemic, messaging against stigma in HIV is commonplace, and the students are likely to have had exposure to HIV campaigns [25]. Many of the students had also had contact with a person living with HIV, which has been shown to reduce stigma [26].

In this study, we used a context-appropriate tailored program to test the translation of knowledge and advocacy as a tool. Knowledge, attitude and self-efficacy in advocacy were assessed pre- and post-intervention. The attributes that have been proposed by Kelland et al. [1] as important for advocacy to be

successful include collaboration, communication, scholarly practice, management, professionalism, passion, perseverance, and humility. These attributes align with the CANMeds framework [27]. Future interventions could look at how to assess the development and application of these attributes. Some aspects like collaboration could be gleaned from the internal assessment of verbal cases presented by the Wits students. In addition, the role of the physiotherapist as an advocate could be strengthened across the curriculum not only in relation to HIV.

The cohorts of students across the three physiotherapy programs were between 21 and 23 years of age, which is the expected age for university attendance. The majority were female at Wits and UNZA, while KMTC had more males. Globally, physiotherapy is a profession that has more females with exceptions, such as in Nigeria and Kenya [28]. In terms of exposure to HIV, 50% of the Kenyan and South African students had participated in voluntary work with people living with HIV. This exposure may have contributed to knowledge in describing health and disability challenges and understanding the broader socio-cultural and economic determinants of health. Another contributing factor could be that many students personally knew someone who was living with HIV. Kenya and Zambia had higher numbers in these areas, while South Africa had just over a third of its students in this category. Between 17 and 30% of students had previous exposure to advocacy and very few actual rehabilitation-related activities. This is unsurprising in a region where the focus of HIV management care has a robust biomedical orientation. The role of rehabilitation is only now becoming more enhanced [29] and needs to be mainstreamed into undergraduate physiotherapy programmes.

Conclusion

A need remains to expand knowledge translation efforts with regard to HIV and rehabilitation. This study highlighted the importance of contextualized interventions to address advocacy and HIV with physiotherapy students. Students who participated in interventions that improved their knowledge and understanding of HIV and had clinical exposure to patients with HIV showed improved knowledge and self-efficacy about their roles as advocates in the management of PLHIV. Further work needs to be done to facilitate capacity building amongst all healthcare workers in this field.

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Data availability statement

The data supporting the findings of this study are available from the corresponding author (HM) on request.

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