



RESEARCH ARTICLE

Increasing HIV Knowledge among Community Workers: Optimizing the Continuum of Care in Davao, Philippines

Danielle A. Walker, PhD, MA, CHES^{1,2*}, Charlyn T. Gambe, RSW, MSSW^{3,4}, Carol J. Ustach, BA², Kristianna Altamirano, MS¹, Sarah J. Templeton, DNP, FNP-C⁵, Mackenna Mason, BS¹, Abigail Cruzen, RN⁶ and Yujin Lee, RN⁶

¹Department of Kinesiology and Public Health, Biola University, USA

²Department of Global Health, Meeting TENTS, USA

³Family Care and Community Development Initiatives, Philippines

⁴Department of Social Work, Assumption College of Davao, Philippines

⁵Student Health Center, Biola University, USA

⁶Department of Nursing, Biola University, USA

*Corresponding author: Danielle A. Walker, PhD, MA, CHES, Biola University, 13800 Biola Ave, La Mirada, CA 90639, USA, Tel: (562)-944-0351 x5917



Abstract

Background: Over 38 million individuals have been diagnosed with Human Immunodeficiency Virus (HIV) worldwide, and the Southeast Asia and Pacific region accounts for 5.8 million of those. Regional progress reduced transmission by 9%, but the Philippines' rising epidemic is largely overshadowed by other countries experiencing tremendous improvement. The Philippines has seen a 203% increase in new infections from 2010-2020, while studies suggest only 2.3% of the population has been tested. Before testing programs can expand, HIV education needs to be evaluated and improved to increase testing. The purpose of this study is to improve HIV knowledge among community workers, which will contribute to latter phases of reducing stigma and increasing testing to build the Davao HIV Continuum of Care.

Methods: A single cohort quasi-experimental design was used with a pre- and post-test bivariate analysis. A convenience sample of 18 community workers, ages 18-54 years was used for HIV train-the-trainer sessions. The HIV-KQ-18 instrument was integrated within training sessions to accurately measure HIV knowledge before and after the intervention. A total of eleven participants were retained for analysis after the exclusion criteria review. Data analysis was conducted with SPSS, and Wilcoxon Rank Sum Test was used to analyze statistical improvement.

Results: Participants demonstrated low levels of HIV knowledge on the pre-test with an average score of 57.55% (SD = 17.99). Post-test scores (79.27%) showed substantial knowledge improvement with an average increase of 21.72 points. The standard deviation also drastically decreased on the post-test suggesting improvement as well (SD = 9.19). This increase was statistically significant as analyses confirmed that participants improved their HIV knowledge after the HIV education intervention ($p = 0.003$)

Conclusion: This study provides a platform to begin to build the HIV Continuum of Care with a multi-phased approach in Davao. Now that HIV knowledge has been improved among clinic and community workers, the next phase of increasing the availability of HIV testing within a community setting can take place. Simultaneously, linkage to care and access to Antiretroviral Therapy (ART) will be integrated through partnership with the local Department of Health.

Keywords

HIV knowledge, HIV education, HIV-KQ-18, Continuum of Care, Philippines

Abbreviations

AIDS: Acquired Immunodeficiency Syndrome; ART: Antiretroviral Therapy; HIV-KQ-18: HIV-Knowledge Questionnaire-18; HIV: Human Immunodeficiency Virus; ICF: International Classification of Functioning, Disability and Health;

UNAIDS: Joint United Nations Programme on HIV/AIDS; PSA: Philippine Statistics Authority; Prep: Pre-Exposure Prophylaxis; PHDOH: Republic of the Philippines Department of Health; WHO: World Health Organization

Introduction

By the end of 2019, a staggering 38.0 million individuals had been diagnosed with Human Immunodeficiency Virus (HIV) worldwide according to data from The World Health Organization [1]. If left untreated, without prevention programs and pharmaceutical intervention, HIV will progress into Acquired Immunodeficiency Syndrome (AIDS), a chronic disease that is life-threatening. Despite the large global prevalence of HIV, new diagnoses have decreased by 39% and fatality has reduced by 51% from 2000 to 2019, because of improving HIV education, increasing access to testing, and providing medications for treatment [1].

Approximately 81% of the global population diagnosed with HIV in 2019 were aware of their HIV status and up to 68% of those adults living with HIV were receiving lifelong antiretroviral therapy (ART) [1]. The WHO takes a proactive approach with HIV treatment through education to improve HIV testing, initiate ART, increase awareness, and expand treatment and Pre-Exposure Prophylaxis (PrEP). The first steps before someone can be linked to care are education and testing. Improving HIV knowledge through education decreases stigma and increases the likelihood of testing, and this method of reducing the burden of HIV has been documented for decades [2-6]. Testing is essential in improving population outcomes, including prevention, treatment, and supportive care. Prevention and treatment can be achieved through ART and other measures. Persons who are active in their HIV treatment and prescribed ART early in their diagnosis will reduce the transmission rate by 96% compared to those who delay starting [7]. Despite all the advances in HIV treatment barriers to testing and care still exist. Even though a standardized cure has not been found, improving HIV knowledge, testing, and access to ART can lower community viral loads to reduce transmission [1,4,5].

The Southeast Asia and Pacific region has made excellent progress in the development of HIV screening and treatment. Approximately 5.8 million people living in this region have been diagnosed with HIV through screening intervention [7]. In regards to secondary interventions, the Joint United Nations Programme on HIV/AIDS (UNAIDS) and Avert estimate that 60% of adults and 65% of children who are diagnosed with HIV are prescribed an ART regimen [7,8]. Despite a 9% decrease in new HIV diagnoses in Southeast Asia and the Pacific countries, the Philippines has increased new HIV diagnoses by a staggering 203% from 2010 to 2020 [7,8]. The Philippines growing prevalence of HIV is not

delineated in regional data. While 79% of the region has been screened for HIV, studies suggest that only 2.3% of the Filipino population has been screened for HIV [7,9-12]. HIV is a significant Filipino health disparity that is prevalent in Southeast Asia and the Pacific regional data, and more educational programs are needed to reduce stigma and increase rates of testing.

The Philippines is a densely populated country with 103.3 million people. HIV prevalence is reported at less than one percent (< 1%) and yet is ranked in the top ten burdens of disease in the Philippines [7,9-11]. Significant population risk factors for HIV include human trafficking, registered female sex workers, long-term migrant work, injection drug use, child marriage, and multiple sexual partners [7,10,11]. The gap in HIV knowledge has been identified in studies focused on women and through the Philippine Statistics Authority (PSA) and International Classification of Functioning, Disability and Health (ICF) [12,13]. Studies have suggested that 97.7% of women ages 18-64 in the Philippines have never been tested for HIV, over 35% did not know where to obtain HIV testing, almost 10% had never heard of HIV, and 17.1% believe HIV can be transmitted through handshaking [12,13].

Due to a drastic increase in HIV new diagnoses in the Philippines, low testing rates and lack of HIV education, an intervention is desperately needed. The purpose of this study is to measure and increase HIV education levels among community workers in an effort to improve community HIV education levels so new testing programs will be accepted. The study will impact the community largely and will contribute towards continued progress in building the Continuum of Care in Davao, Philippines.

Methods

Prior to the initiation of this study, an ethics committee reviewed the details of the research project and determined there was no significant risk to participants. The participant population included clinic workers and community workers in Davao. An informed consent was read to all volunteers in the participants' first language. Then each volunteer was given the opportunity to ask questions and to opt-out. Languages of informed consent included English, Cebuano, and Sinama Badjao. Culturally appropriate participant compensation was provided to participants. Pre-test and post-test results were confidential and de-identified for analysis.

The study design is a single cohort, quasi-experimental study with a pre-test and post-test bivariate analysis. A convenience sample of 18 Davao clinic and community workers, male and female, aged 18-54 years were used in this study. Participants were selected based on a self-reported desire to participate in an HIV train-the-trainer session and completed a pre-test and post-test. Those under the age of 18, residing outside of Davao were excluded, as well as those who did not complete

pre-test and post-tests. Overall, 11 participants were retained through study completion seen in [Table 1](#).

After consenting to participate in the study, participants were given a pre-test, the HIV-Knowledge Questionnaire-18 (HIV-KQ-18) [14-16]. This test was administered by the Principal Investigator (PI) and the clinic director by reading aloud to the participants in their local dialect as they read along on their own paper. All subjects were given the opportunity to ask questions pertaining to test clarification during the testing. The

PI then educated the participants on HIV utilizing the train-the-trainer teaching model. After the educational intervention, participants were then given the same HIV-KQ-18 test. The test was administered by the PI and clinic director and was utilized to evaluate the efficacy of HIV education. Tests, pre and post, were paired and patient confidentiality was maintained. Confidentiality was preserved via the removal of the participants' names from forms and tests and was replaced through a coding system.

The HIV-KQ-18 instrument was chosen because it has high reliability and strong evidence for validity. Statistically, this assessment has high to very high internal consistency across samples ($\alpha = 0.75-0.89$) and test-retest reliability indicates high sustainability ($r = 0.76-0.94$). Correlational validity between the HIV-KQ-18 and HIV-KQ-45 is strong ($r = 0.97$). The reliability and validity coefficients support that the HIV-KQ-18 is internally consistent, stable, and valid [14-16]. Furthermore, [14] tested and verified the HIV-KQ-18 is suitable for low literacy groups.

Statistical analyses were conducted using the Statistical Package for the Social Sciences version 26 (SPSS). Initial univariate analyses showed that the variables were not normally distributed. Therefore, a nonparametric bivariate analysis was performed using the Wilcoxon Rank Sum Test to compare the difference between the pre-test and post-test data collection to identify if statistically significant improvements were made. A family-wise error rate of $p \leq 0.05$ was used to determine the statistical impact of the intervention.

Table 1: Participant demographic distribution.

Participant Demographics				
		Group 1	Group 2	
Gender	Male	2	2	(18.2%)
	Female	9	9	(81.8%)
Age	18-24	0	0	(0.0%)
	25-34	5	5	(45.5%)
	35-44	4	4	(36.4%)
	45-54	2	2	(18.2%)
Education	Primary	0	0	(0.0%)
	Secondary	3	3	(27.3%)
	Vocational	2	2	(18.2%)
	College Degree	6	6	(54.5%)
	Advanced Degree	0	0	(0.0%)

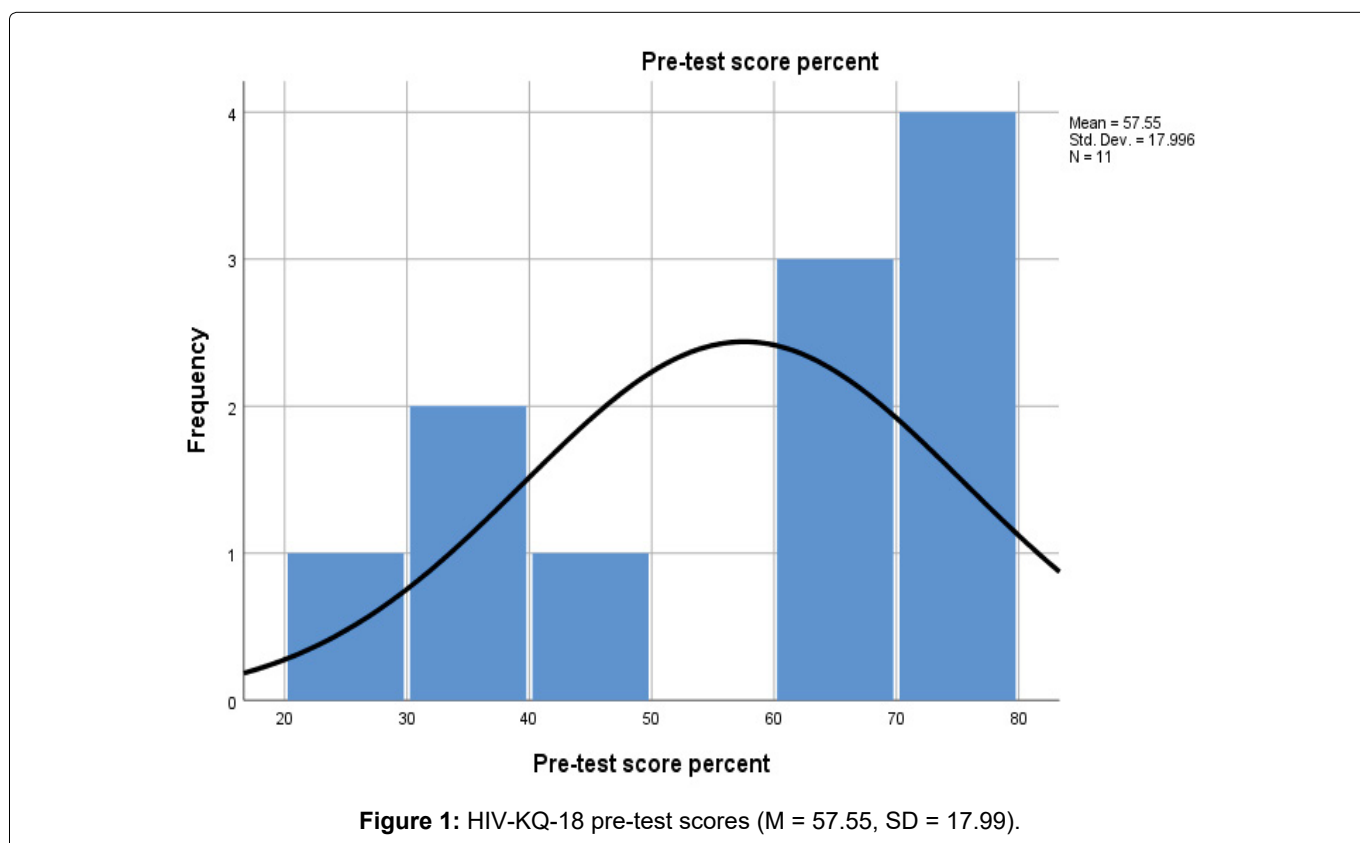


Figure 1: HIV-KQ-18 pre-test scores (M = 57.55, SD = 17.99).

Results

Demographics

Participants included clinic and community health workers with a gender distribution of males (18.2%) and females (81.8%) ranging from 18-54 years-old. After incomplete tests were removed for analysis, the participant age distribution was 18-24 years (0%), 25-34 years (45.5%), 35-44 years (36.4%), and 45-54 years (18.2%). Educational attainment varied among participants as some community workers began working after secondary education (27.3%). Clinic workers tended to have higher levels of education including vocational degrees (18.2%) and college degrees (54.5%).

Univariate analysis

Among participants, the mean HIV-KQ-18 pre-test score was 57.55%. Pre-test scores, as seen in [Figure 1](#), widely ranged from 20-80% correct with a standard deviation of 17.99. After the intervention, the mean HIV-KQ-18 post-test score increased by 21.72 points to an average of 79.27%. Post-test scores, as seen in [Figure 2](#), reduced to 56-90% correct, along with a decreased standard deviation (9.19), both indicating improvement.

Bivariate analysis

Wilcoxon Rank Sum Test was used to compare the pre-test scores and post-test scores of participants. The results, as seen in [Figure 3](#), showed significance improvement between pre-test scores and post-test scores after the intervention. Participants notably improved their HIV knowledge from the train-the-

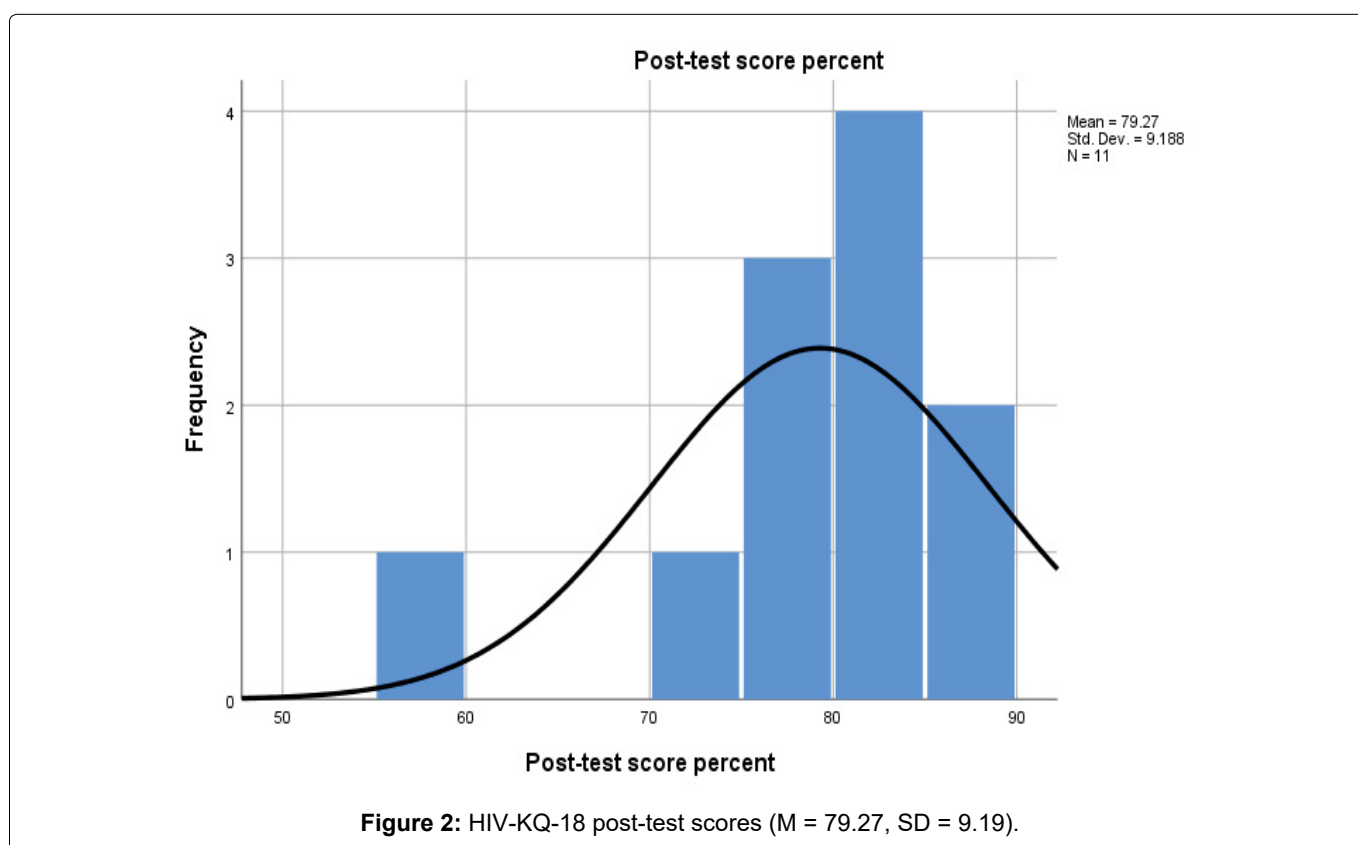
trainer HIV education intervention. This increase was statistically significant as analyses confirmed that participants increased their HIV knowledge after the HIV education intervention ($p = 0.003$).

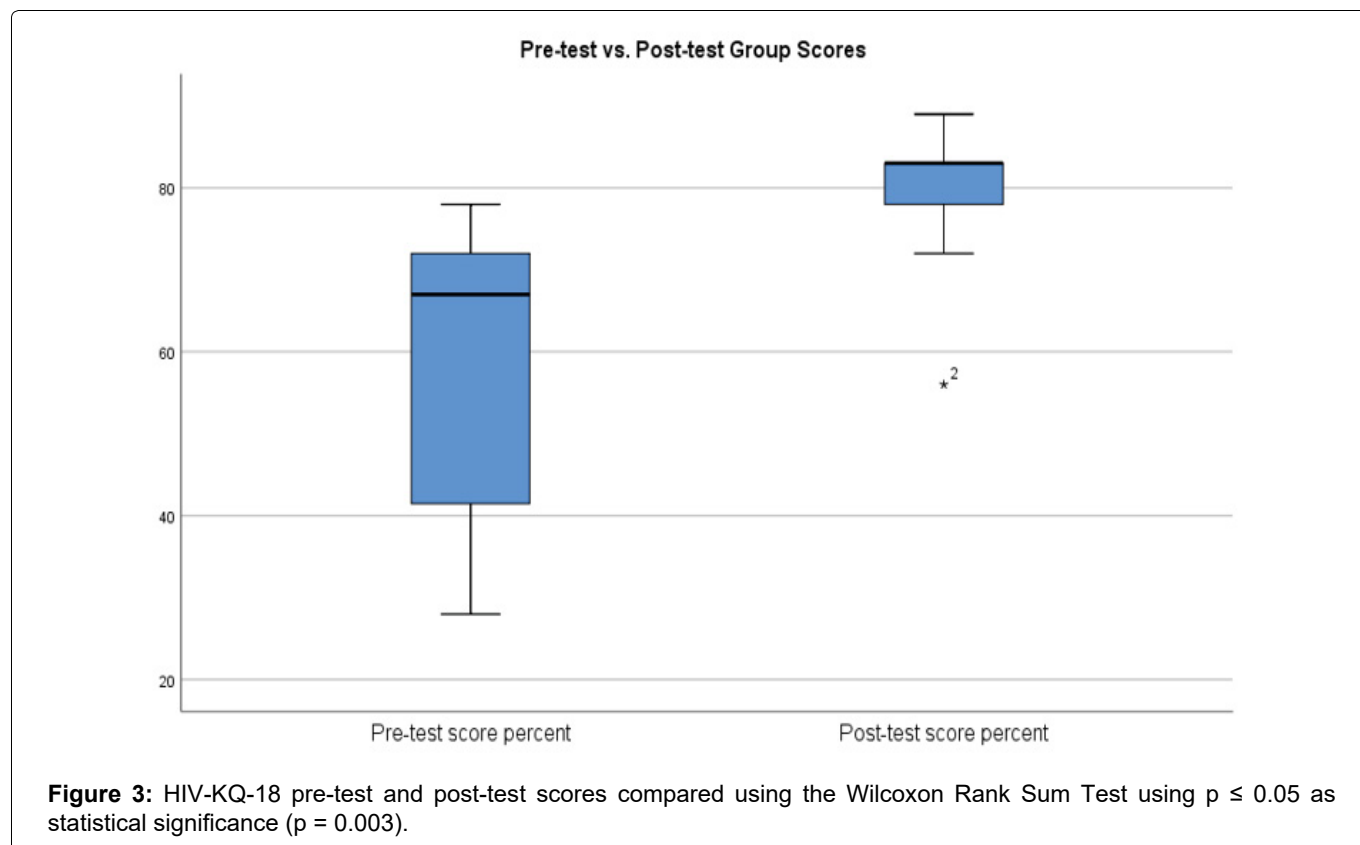
Discussion

Implications

The goal of this study was to improve HIV knowledge among local clinic workers and community members in Davao, Philippines. Timely inclusion of evidence-based practices, such as HIV testing, in healthcare settings helps to improve patient outcomes [17]. Education is key to increasing awareness and stakeholder buy-in regarding important public health quality improvement initiatives. In this study, three specific aims were identified to improve HIV knowledge in the community of Davao. A pre-test was provided to study participants to assess baseline knowledge of HIV. Next, HIV educational programming was provided to the participants in a community-based healthcare clinic in Davao. Finally, a post-test was provided to study participants in order to measure post-intervention knowledge. There was a statistically significant increase in HIV knowledge following participation in the HIV educational sessions.

This study makes several important contributions to the local community of Davao and to improving health outcomes for people affected by HIV. In an effort to improve patient outcomes, providers should engage in continued education regarding evidence-based practices and assimilating those initiatives into practice to mitigate gaps. The HIV education provided to the





healthcare workers in Davao can improve practices in their community clinic, including increased testing for community members at risk for HIV. Education provides an opportunity to engage with clinicians and community members to promote buy-in regarding the importance of HIV testing. An area for further research would be to examine any uptake in HIV testing following HIV educational programming.

The train-the-trainer model utilized in this study is an excellent public health tool to empower community leaders to share knowledge within their own region and beyond. Researchers can educate, but utilizing train-the-trainer models within educational interventions provides accessibility for community members beyond the scope of a single study. Davao now has a pool of competent HIV instructors who can train others. Educated trainers help to promote evidence-based practices, such as testing high-risk individuals, within their communities. Increasing HIV testing rates is one population health initiative that can make a significant impact on mitigating the prevalence of HIV in the Philippines.

The results from this study can be utilized to assist other community organizations and local Departments of Health to improve health disparities in various communities. Providing local leaders with the tools such as train-the-trainer models is a sustainable strategy to reduce the prevalence of illness. Locally trained clinicians and community workers now have the ability to educate their peers as well as reveal the importance of HIV testing in mitigating disease

within their community. Education and community collaboration are key strategies to improve compliance with recommended evidence-based practices. It could be a catalyst for developing a community-wide HIV testing plan.

This study is the second phase of eight planned in collaboration with a number of community stakeholders and entities. This was initiated by a formal community assessment that identified several risk factors for HIV transmission along with low testing rates and a prevalence rate that is not representative of the population. Phase three and four results will be published as community education, and expansion of HIV testing certification programs in collaboration with the Department of Health (DOH) are key components in utilizing the findings. The project will continue building the continuum of care through the implementation of holistic HIV education, testing, and linkage to care programs seen in [Figure 4](#). It is imperative that HIV education and knowledge become the foundation to reduce stigma and increase testing in this region.

Community viral suppression cannot exist without access to ART, which comes from linkage to care within holistic multidisciplinary educational and testing programs. Program implementation and the phases outlined provide a foundation to successfully build a continuum of care within the design of this collaborative project.

Limitations

There are several study limitations to acknowledge.

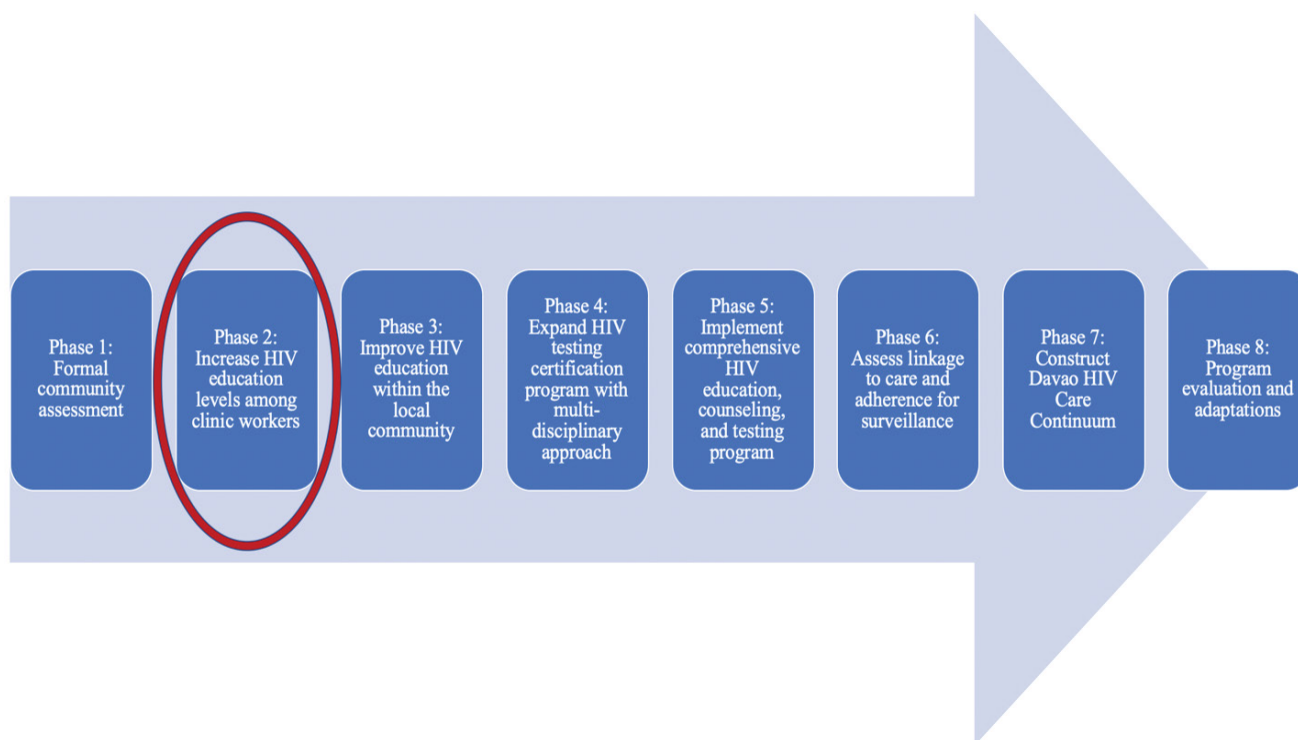


Figure 4: Collaborative research, program planning, and capacity building phases for Davao, Philippines. The current study is in phase two of eight within this multidisciplinary approach.

The study participants consisted of a small, homogeneous, convenience sample. Generalizability may be limited. There can be risks of type 2 errors and the sample size limits further multivariate analysis. However, in this study, there was no evidence of a type 2 error despite the sample size. There were several participants lost to attrition due to incomplete pre-tests and post-tests. Lastly, there was a language barrier between the participant's native language and that provided on the pre-test and post-tests. However, an interpreter was available to the participants for consultation and assistance.

Conclusion

This study provided a platform to begin understanding how to improve the population health of HIV care with a multi-phased educational approach in Davao. This first phase included increasing HIV knowledge among community and clinic workers. Future initiatives and research will include increasing HIV education within the local community, developing and implementing an HIV counseling and testing program with linkage to care, support adherence, and creating an HIV Continuum of Care for the City of Davao. Evaluation and adaptations will be vital through all of the phases. A multi-phased strategic approach is essential to sustainability. While education will be paramount to the success of this program, several sustainable systems will need to be developed, in later phases, to address the HIV disparity in Davao.

It is essential for the local community to catch the vision for this program. Understanding the effects and risks of HIV are important in creating awareness around the HIV epidemic in Davao. However, the community also needs to be supported with tools such as HIV education, stigma reduction, access to testing and pharmacologic treatments to mitigate disease transmission. International partnerships and collaborations have already been established between nonprofits, universities, DOH, clinics, and local government to unify efforts in the upcoming phases of building the HIV Continuum of Care.

HIV is a significant health disparity affecting those living in the Philippines and prevalence is increasing at an alarming rate. The fact that these rates are increasing so quickly with such low testing rates (< 3%) suggests that more people are suffering from HIV and education and testing programs are needed to reduce the burden of disease [12,13,18]. One method of addressing marked public health issues is to improve awareness. In this case, HIV education was provided to community workers in the community of Davao. A quasi-experimental, pre-test and post-test study was designed to measure whether HIV education can increase knowledge of HIV in local clinic workers. A statistically significant ($p = 0.003$) improvement in HIV knowledge was found in study participants per a Wilcoxon Rank Sum test. An HIV educational program helps improve HIV knowledge among local clinic healthcare workers in the community of Davao. As HIV awareness is increased, the overall goal

is to improve testing in the community. A multi-phased approach is needed to address the long-term needs of the community, including HIV testing, treatment, and ongoing access to healthcare providers. Collaboration with both local and abroad community partners can help to continue the momentum in this community and come alongside the educated HIV trainers in Davao. The hope is that this study continues to bring a positive impact on the Davao community throughout its multiple phases.

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