

Implementation of the use of Depression Screening Tool in a HIV care Setting

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Abstract

Depression is one of the most common psychiatric disorders prevalent among people living with HIV/AIDS (PLWHA). This project was centered on implementing the use of a depression screening tool in detecting depression among PLWHA in a HIV care setting. The purpose of the study was to identify depression, and to establish the need for routine depression screening exercise among PLWHA. The project also explored the differences in PHQ-9 scores within the sociodemographic subgroups. Age, gender, ethnicity, income level, educational level, marital status, and employment status, and health insurance were the studied sociodemographic factors. The participants comprised 32 PLWHA who are between the age 18 and 89 years, and who resides in a long-term HIV/AIDS care setting. A standardized depression screening tool known as Patient Health Questionnaire (PHQ-9) was utilized to screen for depression among the participants who met the study criteria. Descriptive statistics were used to analyze the data, and a nonparametric test (Kruskal-Wallis test) was used to analyze the differences among each of the sub-groups within the sociodemographic factors. The use of PHQ-9 as part of standard HIV care detected depression among PLWHA. Depression was defined as PHQ-9 score of ≥ 5 . Possible depression was detected in 12(52.2%) of the participants who completed the PHQ-9. The majority of the participants who met the depression criteria were within the age group of 40-60 years, Black or African American, male, and single. Participants with a high school diploma, low income level, and those who were unemployed and depended solely on government funding for treatment also met the criteria for possible depression. The preliminary prevalence of depression was 28%. Routine depression screening and early linkage to depression treatment and management will improve HIV treatment outcome and reduce HIV transmission in the long run.

Keywords: Depression, PHQ-9, HIV/AIDS, people living with HIV/AIDS

Introduction

Human immunodeficiency virus/ Acquired immunodeficiency syndrome (HIV/AIDS) is one of the most dreaded chronic illnesses of the 21st century with multiple psychiatric comorbidities including substance abuse, depression, anxiety, post-traumatic stress disorders, sleep disturbances, and psychosis (Nedelcoych et al., 2017). Among people living with HIV/AIDS (PLWHA), clinical depression appears to be one of the psychiatric comorbidities with relatively high prevalence. Depression, also known as major depressive disorder, is characterized by a period of at least two (2) weeks during which there is either depressed mood or loss of interest or pleasure in nearly all activities, together with at least four (4) of the following symptoms: changes in appetite, sleep, and psychomotor activity; decreased energy, feeling of worthlessness or guilt; difficulty thinking, concentrating or making decisions; or recurrent thought of death or suicidal plans or attempts (American Psychiatric Association[APA], 2013, p.163).

Compared with 10% lifetime prevalence of major depression seen in the general population, the lifetime prevalence of depression in PLWHA is 22%, which is two-fold that of the general population (APA, 2018). Despite its high prevalence, clinical depression among PLWHA is often not identified, and therefore undiagnosed or under-diagnosed by HIV care providers. The project focused on screening for depression among PLWHA in a comprehensive HIV/AIDS care setting. Patients who consented to be part of the study were screened for depression using a validated screening tool known as Patient Health Questionnaire-9 (PHQ-9). Routine depression screening using the PHQ-9 scale in an HIV care clinic will help HIV care providers identify depression among PLWHA. Early detection of depression among PLWHA, and consequent referral for depression treatment, will help address antiretroviral therapy (ART)

adherence issues; promote viral suppression; and reduce HIV related morbidity and mortality, as well as the rate of HIV transmission across United States, and globally. Behavioral health screening is the first vital step identified by the New Jersey Department of Health, Division of HIV, STD, TB Services (DHSTS) towards ending HIV/AIDS in New Jersey (New Jersey Department of Health, 2018). This project will help to foster the need for integration of behavioral health services with HIV primary care services.

Background and Significance

Depression is one of the most common reported psychiatric co-morbidities of HIV infection with a prevalence rate of 20%-40% among people living with HIV (PLWH) in the United States (Edwards et al., 2014; U.S. Department of Veterans Affairs, 2018). Depression can affect PLWHA in diverse ways resulting in rapid deterioration of all aspects of their life. People living with HIV/AIDS who suffer from depression are unable to actively participate in their care, resulting in missed appointments, non-adherence to ART, and indulgence in high-risk behaviors. Additionally, PLWHA who are depressed have the tendency of infecting others. In the process PLWHA may acquire a strain of virus that might be resistant to an existing ART, consequently increase their own viral load (Arseniou, Arvaniti, & Samakouri, 2014). Untreated depression among PLWHA could also result in reduced work productivity and income (Wagner et al., 2017). The motivation to function optimally at work could be reduced due to health-related concerns.

Routine screening for depression and other mental health disorders among PLWHA is necessary at every encounter with an HIV care specialist for identification and referral to a mental health specialist. People living with HIV/AIDS require holistic health care the same way as patients with other chronic illnesses; depression screening is one of the ways to remove the

obstacles that could impede HIV care continuum which include: HIV diagnosis, linkage to care, retention of care, treatment using ART, and achievement of viral suppression (Fojo et al., 2018). The United States Preventive Services Task Force (USPSTF, 2016) recommends depression screening in the general adult population due to the perceived benefits associated with early detection of depressive symptoms in management of HIV. The USPSTF suggests that depression screening should be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up. The 2013 Primary Care Guidelines for the Management of Persons with HIV also recommends that medical providers should assess patients for depression using direct questions or validated screening tools at the initial medical visit and at periodic intervals (Kinney & Cournos, 2017).

In primary care settings, specifically HIV clinics, depression among PLWHA is often viewed by healthcare providers as an anticipated adverse effect of ART medications; thus, depression often goes undetected, undiagnosed, or under-diagnosed and untreated (Bhatia & Munjal, 2014). Undiagnosed or under-diagnosed depression can impede better clinical outcomes of HIV care and interfere with self-care behaviors necessary to achieve effective HIV care continuum (Chaudhury, Bakhla & Saini, 2016). Globally, studies suggest that most PLWHA receive little or no mental health services. The recent survey by the World Health Organization (WHO) on the availability of mental health services for PLWHA revealed that only 38% of national HIV managers reported providing routine mental health screening in HIV care settings, while 43% reported not providing any mental health screening or treatment for PLWHA. There is currently no country where routine mental health screenings for PLWHA are implemented uniformly across the nation (WHO, 2017).

Much emphasis is placed on the risk of HIV transmission but issues relating to psychosocial and mental health care needs of PLWHA are often not addressed. Akena, Stein and Joska (2013) in their study suggest that failure to routinely screen for depressive symptoms in PLWHA could be due to the little amount of time providers spend with the patients, as well as providers' lack of mental health knowledge and stigma associated with HIV. The extent to which PLWHA are routinely screened for depression using validated screening tools during visits in HIV care settings is less well known.

The four key areas of advancement of the National HIV/AIDS Strategy (NHAS) five-year plan includes: widespread testing and linkage to care, broad support for people living with HIV to remain engaged in comprehensive care, universal viral suppression, and full access to PrEP services (NHAS, 2017). Depression screening will serve as one of the approaches geared towards attaining success in the above-mentioned key areas of advancement in the NHAS five-year plan.

Needs Assessment

Globally, it is estimated that over 36.9 million people are living with HIV/AIDS and over 21.7 million are treated with ART (Joint United Nations Programme on HIV and AIDS [UNAIDS], 2018). In the U.S., it is estimated that over 1.1 million individuals were living with HIV by the end of 2015. In 2016, the U.S recorded 15,807 deaths among people diagnosed with HIV (Center for Disease Prevention and Control [CDC], 2019). New Jersey, with a total population of 8,944,469, has about 37,411 persons who are currently living with HIV. Out of the total population of people living with HIV in New Jersey, 9,601 reside in Essex County. In Essex County, the city of Newark has the highest number of people living with HIV. It is estimated that

5,600 persons between the age of 13 to 55 and above are living with HIV in Newark (New Jersey Department of Health, Division of HIV, STD, TB Services, 2017).

The success of eliminating HIV/AIDS is determined by the viral suppression rate. New Jersey has a couple of programs in place to help achieve the NHAS viral suppression goal of 90% by 2020. These programs include the Ryan White program, Hyacinth AIDS foundation, Substance abuse and Mental Health services, Housing opportunities for persons with HIV, Center for Disease Prevention and Control, and AIDS Drug Assistance Program (ADAP). With the help of these programs, which are funded by the federal government, the state of New Jersey was able to achieve a 52% viral suppression rate in 2015, which is greater than that of the national rate of 30%, but less than the NAHS viral load suppression goal of 90% by the year 2020 (New Jersey Department of Health Integrated HIV Prevention and Care Plan, 2018).

HIV/AIDS constitutes a significant financial burden on both the government and individual households. As of 2015, the estimated lifetime medical cost of caring for an HIV infected individual at age 35 years was \$326,500, which is 3 times higher than that of an uninfected individual of the same age (Schackman et al., 2015). The economic drain on the federal government arising from expenditure on HIV/AIDS care could be huge. For instance, in 2016 fiscal year alone, New Jersey received a total of \$113,486,362 as HIV/AIDS federal funding, and \$2,222,710 of the total federal funding was allocated to substance abuse and mental health services of PLWHA. The remaining funds were distributed among other federal sponsored HIV/AIDS programs in the state (AIDSVU, 2019). HIV/AIDS also imposes a substantial non-medical cost on an infected person and their caregivers in terms of time, effort, and commitment. Depression screening as part of the mental health services provided to PLWHA could be one of

the giant steps taken to offset these financial and other burdens incurred by the government and the patient on a yearly basis.

Problem Statement

Depression interferes with the quality of life of PLWHA and has been associated with the high risk of HIV acquisition, non-adherence with antiretroviral therapy (ART) regimen, progression of HIV disease, and worsening of immunodeficiency (U.S. Department of Veterans Affairs, 2018; Uthman, Magidson, Safren, & Nachega, 2014). Undiagnosed or untreated depression can constitute a significant disruption to the HIV care continuum, preventing the attainment of optimal clinical outcomes among PLWHA. Depressive symptoms among PLWHA are often viewed as advanced signs and symptoms of the disease by HIV/AIDS care providers. Screening for depression at every initial visit and unspecified periodic visits using a validated screening tool has been recommended by the 2013 Primary Care Guidelines for the Management of Persons with HIV. Unfortunately, routine screening for depression is a practice which has remained difficult to establish among primary care providers who care for HIV/AIDS population in HIV care settings.

Based on this information, the population, intervention, comparison, and outcomes (PICO) question for this project is: Will implementation of the use of the PHQ-9 assist providers in the detection of depression in people living with HIV/AIDS in a HIV care setting?

Aims and Objectives

This project aims to demonstrate the need for depression screening among PLWHA in a HIV care setting. The above aim was achieved with the help of the following objectives:

1. To implement the use of PHQ-9 in screening for depression among PLWHA in a comprehensive HIV care setting.
2. To identify the differences in PHQ-9 scores within the sociodemographic subgroups in a comprehensive HIV care setting.
3. To estimate the prevalence of depression among PLHWA in a comprehensive a HIV care setting.
4. To provide recommendations for HIV/AIDS care clinic in terms of incorporating depression screening as a part of routine care.

Review of Literature

Search Strategy

A search was conducted to identify relevant literature relating to the use of Patient Health Questionnaire- 9 (PHQ-9) in detecting depression among People living with HIV/AIDS in HIV care settings. Key words included: HIV, HIV patients, People living with HIV/AIDS, depression, health surveys, Patient Health Questionnaire (PHQ-9), HIV clinics, HIV care settings. The databases used were PUBMED, CINAHL, CLINICALKEY and MEDLINE. Articles that were reviewed include the following designs: meta-analysis, systematic review, quantitative, qualitative, expert opinion, and gray literature. The search generated 75 hits for all the key terms, three of them were clinical trial articles (PRISMA flowchart located in appendix A). The search was limited by language of publication (English) but not the study design.

Depression and HIV/AIDS.

Depression is a common comorbid psychiatric disorder among PLWHA, however, tracing the cause of depression in PLWHA can be challenging because depression could present with several entry points such as HIV/AIDS disease progression, ART side effects or being

newly diagnosed with HIV infection (American Psychiatric Association, 2019). As HIV progresses, it can damage the subcortical regions of the brain leading to HIV dementia which often presents as clinical depression. Opportunistic infections arising from the HIV disease progression such as hepatitis *pneumocystis carinii* pneumonia and endocrinopathies can also manifest depressive symptoms. Some HIV medications including interleukin, zidovudine, sustiva, zalcitabine, stavudine also have side effects that mimic depression (American Psychiatric Association, 2019).

Multiple studies have been conducted to identify the association between depression and HIV/AIDS. In a review study by Arseniou, Arvaniti, and Samakouri (2014), the prevalence rate of depression among PLWHA depends on gender, age, pre-infection history, and disease stage. Women with HIV/AIDS having depression was 19.4% as compared to 4.8% seronegative women. Among PLWHA over the age of 50 years old, the depression rate was 20% and 12% among younger age groups. Among 22 life-time depressed PLWHA, only one reported having depression before being diagnosed with HIV/AIDS, and depression was high in symptomatic (38%) patients as compared to HIV patients without symptoms (13.3%). Arseniou et al. also found biological factors such as alteration in white matter structure, and psychosocial factors such as stigma, body image, isolation, history of comorbid psychiatric illnesses, and perinatal period in women with HIV are all predictors of depression.

Depression among PLWHA can lead to a reckless life style leading to the spread of HIV/AIDS and development of resistant strains of the virus thereby thwarting the efforts of public health stakeholders in curtailing HIV/AIDS. HIV risky sexual behaviors such as alcohol abuse, sex without protection after drinking, having multiple sexual partners and cigarette

smoking are also associated with depression especially among the young adults (Othieno, Okoth, Peltzer, Pengpid, & Malla, 2015).

Deshmukh, Borkar, and Deshmukh (2017) established that depression impacts the quality of life (QOL) of PLWHA negatively. Using the depression, anxiety, stress subscales, and full scale (DASS-21) which measures depression and associated symptoms, they was found that fifty percent (50%) of the studied participants (754) suffered depression, and out of 165 patients who were symptomatic with opportunistic infections, 68.5% were depressed and were also 2.7 times at risk of becoming depressed as compared to HIV patients who were asymptomatic. Women, illiterates and unemployed participants had high prevalence of depression. The quality of life (QOL) was lower in patient who suffered depression than those who had no depressive symptoms.

Depression is associated ART non-adherence. In a study by Beyene et al., (2019), poor ART adherence was found to be associated with increased risk of HIV/AIDS treatment failure and the development of strain virus in PLWHA who suffer from depression. The study identified over 35.2 % of the total HIV participants with depression. Factors such as living alone, non-adherent to ART, not eating healthy, having a history of ART side effects and having the progression of the disease beyond HIV/AIDS WHO stage I were associated with prevalence of depression. In HIV positive men who have sex with men (MSM), depression was also reported as a contributory factor to ART non-adherence and nonattainment of viral suppression (Tao et al., 2017). PLWHA and depressed were found to be missing appointments, non-adherent to ART and therefore were at risk for non-viral load suppression (Bengtson et al., 2019). In a study by Sowa, Bengtson, Gaynes, and Pence (2015), PLWHA and depressed were treated with antidepressants and over 12 months of the study, 73 of 149 individuals achieved remission of

their depression, and the remaining participants with comorbid substance abuse and anxiety disorders did attain remission even though at slower rate. Treatment of depression tends to improve the adherence rate of ART.

Depression is prevalent among PLWHA with low income level. Low income level can be accounted for by a cascade of factors including educational level, employment status, types of employment, side effects of ART, and the stage of progression of HIV/AIDS. In a study by Asangbeh, Sobngwi, Ekali, Eyoum, and Msellati (2016), in West Cameroon, Central Africa, 35.2% of the participants with HIV/AIDS were patients with low income level (less than \$40 per year) and CD4 count less than two hundred.

Depression is a common psychiatric disorder among PLWHA (46.3%) who have multiple sex partners, gay relationships, and a history of physical and verbal abuse from family members; this was assessed using PHQ-9 (Ahaneku et al., 2016). In another study by Wang et al. (2018), there was significant prevalence of depression and depressive symptoms among general people living with AIDS (50.8%), HIV positive men who have sex with men (43.9%), HIV positive persons who were blood/plasma donors (85.6%), and among the HIV positive population (51.6%).

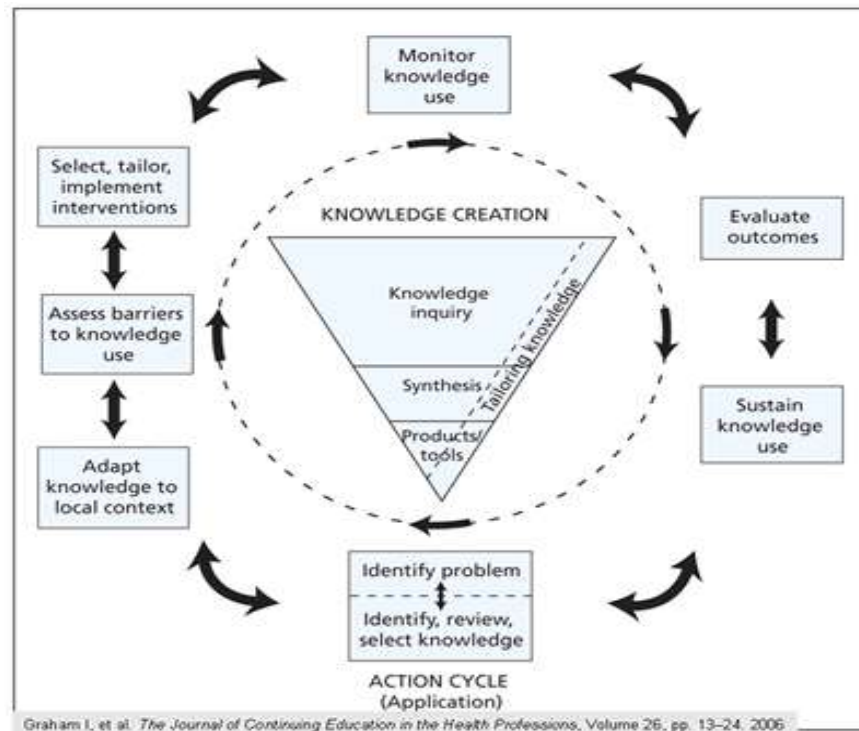
From this review, it is evident that depression is a common psychiatric disorder suffered by PLWHA globally, though the extent and prevalence of depression might differ. Socio-demographic factors such as age, marital status, low income, educational level, and employment are strong determinants of the prevalence of depression among PLWHA. Core depressive symptoms, such as anhedonia, feelings of worthlessness, and recurrent thoughts of death can cause self-care deficit which can affect the individual ability to manage treatment activities such as adherence to treatment regimen, and medication refills. Early identification of depressive

symptoms via routine screening and prompt referral to psychiatric experts for treatment could result in better health outcomes for PLWHA.

Theoretical Framework

Knowledge to Action

Knowledge translation (KT) was defined by Canadian Institutes for Health Research as a “dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the health care system” (Straus, Tetroe, & Graham, 2009, p.165). The end goal of KT is to improve health outcomes and promote effective healthcare practices by addressing the gaps between research synthesis and implementation in healthcare. The Knowledge to Action (KTA) framework on the other hand is one of the knowledge translation models developed by Graham and colleagues in Canada to facilitate the application of evidence-based research knowledge into practice by stakeholders such as policymakers, health practitioners, patients and the entire public (Graham et al., 2006). The framework was developed to address the problem arising from the heterogeneity in terms used for translating the best available knowledge into real health interventions. The Knowledge to Action (KTA) framework comprises two major discrete components: Knowledge creation and Action Cycle. Each of these two components contains phases which are connected, and interrelated, and can affect each other (Field, Booth, Ilott & Gerrish, 2014). The KTA framework is located in appendix K.



Knowledge creation.

The knowledge creation component of KTA is represented by the triangular picture in the center of the diagram. Graham et al., (2006) likened the knowledge creation component of KTA to a funnel. Knowledge tends to become more refined and filtered as it goes from the wide end of the funnel to the narrow end, leaving the most valuable knowledge available to the end users. The knowledge creation part comprises three stages: knowledge inquiry, knowledge synthesis, and knowledge tools/products. The knowledge inquiry stage involves the primary knowledge or the first-generation knowledge that is usually crude and unfiltered and may or may not be readily available. The second phase known as knowledge synthesis comprises more refined knowledge produced through systematic reviews, meta-analysis, and meta-synthesis of information relevant to what is being studied. The third phase of knowledge creation is the knowledge tools/products. Graham et al., (2006) identified practice guidelines, algorithms, and decision aids and rules as knowledge tools. These tools present knowledge in a clear, succinct and user friendly manner in

order to influence stakeholders' previous knowledge and practices and convince them to accept and apply newer refined practices. As knowledge pass through each of the phase of knowledge creation, it becomes more refined, and clearer, and the evidence becomes stronger.

Action cycle.

The Action cycle comprises the steps involved in the knowledge application. It consists of seven steps which are dynamic and iterative and may require feedback between phases. The steps are not unidirectional, they can influence each other and can be influenced by knowledge creation component of the KTA as well (Sudsawad, 2019). The Action cycle steps are common derivatives from over 60 models and frameworks reviewed by Graham et al. (2006, p.20). They include:

1. Identification of problem and selection of knowledge or research relevant to the problem.
2. Adaptation of knowledge use to the local context
3. Assessment of barriers and facilitators to knowledge use, as well as potential adopters
4. Development and Implementation knowledge to action plan
5. Monitoring the implemented knowledge to determine the effectiveness of plan. Consider reassessing the barriers, facilitators and potential adopters if the plan is not working.
6. Evaluation of outcomes knowledge use
7. Sustain the knowledge use over time. The challenges faced during implementation stage may vary from that of the sustaining phase.

Application of Knowledge to Action

The steps of the KTA Framework are being applied in the following manner

Identification of problem and selection of knowledge or research relevant to addressing the problem.

The project managers approached the management of an HIV care facility who identified that depression screening using PHQ-9 is not a routine practice at their facility. Prior to meeting with the management of the facility, the project managers had searched the literature to obtain the practice guidelines recommending depression screening of PLWHA as routine practice. The literature was also searched to address this knowledge-practice gap.

Adaptation of knowledge use to the local context.

The project managers explored the usefulness and importance of the depression screening to the end users (healthcare providers and patients alike) in the facility. The investigators met with the management, the coordinator of mental health services, social workers, nurses and support group to review the importance of routine depression screening among patients living with HIV/AIDS through a brief workshop.

Assessment of barriers and facilitators to knowledge use, as well as potential adopters:

The stakeholders include: the facility care coordinator, mental health counsellors, and registered nurses and supporting staff. The following barriers were encountered during project implementation process: lack of knowledge of the importance of depression screening, staffing issues, lack of time and capacity, language barrier, limited knowledge of PHQ-9 screening tool, and staff resistance to change.

Select, tailor, and implement interventions to promote use of the knowledge

During this step, the project managers will screen for depression by administering the PHQ-9 screening tool to patients in the facility and teaching staff how to use the PHQ-9.

Monitoring the implemented knowledge to determine the effectiveness of plan.

The project managers will monitor the use of PHQ -9 tool in a screening for depression in PLHWA by the care providers of the facility. If they are using the PHQ-9 routinely, the investigator will commend their efforts in adoption to change, if they are not using the PHQ9, then the project managers will explore the barriers to adoption of change and seek to resolve them.

Evaluation of outcomes knowledge use

The project managers will evaluate whether the use of PH9 screening tool was successful in identifying PLWHA who were depressed by analyzing the collected data.

Sustainability of administration

The project managers will share the findings of this project with stake holders of the facility and encourage them to consider the inclusion of the PHQ-9 depression screening tool into their monthly assessment package.

Methodology

Study design

This project was conducted using cross-sectional study design with a convenience sample. The purpose of this design was to implement the use of PHQ-9 in screening for depression among PLWHA in order to determine the prevalence of depression among PLWHA

and to establish the need for routine depression screening in a HIV care setting. The project also explored the differences in PHQ-9 scores within the sociodemographic subgroups.

Setting.

The setting for this project is a 78-beds capacity long term care health facility located in North Newark New Jersey. Sixteen of the 78 beds are dedicated to rehabilitation. The facility is a non-profit, nongovernmental organization established to meet the needs of PLWHA. Services provided by the site include: medical/nursing care, wound care, substance abuse treatment, palliative care, pain management, nutritional services, psychiatric services, safe sex education and physical therapy.

Study population.

The study population included thirty-two (32) individuals living with HIV/AIDS who reside in the facility. People living with HIV/AIDS who are between the age of 18 and 89 years, and who are willing to participate in the study with a written informed consent were included in the project. Participants who were already diagnosed with depression were excluded from completing the PHQ-9 depression screening tool. Residents who were unable to communicate either because of illness or inability to understand English language were also be excluded.

Subject recruitment.

Participants of this project were recruited using a convenience sampling technique. Flyers (Appendix I) containing information on the project were distributed to residents of the project setting. The project managers verbally explained the content of the flyer and the nature of the project to the residents using simple language.

Consent procedure.

Participants were provided with informed consent forms (Appendix H), followed by explicit verbal explanation of the content. All participants' concerns were addressed prior to the signing of consent form. Participants were made aware that all collected data pertaining to the project will be kept strictly confidential. Information collected from participants will not be used by the project managers for other research purposes. Completed forms are stored in a locked cabinet control by the project managers no longer than six years. Residents were made aware that participation in this study is voluntary. Residents who are already enrolled in the study can withdraw at any time without turning in a completed form. Residents were assured that their participation in the study or withdrawal from the study will not affect the services provided to them by the facility.

Risks/harms/ethics.

Breach of confidentiality is a possible risk of harm but there is no anticipated risk associated with this project, however, participants who may be uncomfortable answering some questions may skip the questions or withdraw from the study altogether. Any concerns arising from the PHQ-9 scores were addressed based on the severity of the results. Participants with PHQ-9 score of 0 to 4 (minimal or no depression) did not receive any intervention. Participants with PHQ-9 score ranging from 5 to 9 were recommended to see mental health counselor in the facility for counseling while participants with score from 10 to 27 were recommended to see mental health providers of the facility for pharmacotherapy and/or psychotherapy.

Subject costs and compensation.

Participants did not incur any cost and instead were given a \$5 cash each after they participated in the project.

Study intervention.

The project managers approached the management and staff of the facility who identified that depression screening using PHQ-9 is not a routine practice at their facility. The project managers met with the management, mental health services coordinator, social workers, nurses and support group to review the importance of routine depression screening among patients living with HIV/AIDS through a brief workshop. Flyers were distributed to residents of the facility, and verbal explanation of the flyer content was given to the residents by the project managers. Written informed consent was obtained from residents who were willing to participate in the project. Participants then completed a sociodemographic form which did not include specific identifiers such as names, social security numbers, and date of birth, place of birth, residential or mailing address, or phone numbers, and the PHQ-9 screening tool will be administered to them. The result of the PHQ-9 scores were categorized as follows: minimal or no depression (0-4), mild (5-9), moderate (10-14), moderately severe (15-19), and severe (20-27). The proposed treatment plans based on PHQ-9 scores and severity were as follows: participants with minimal or no depression required no interventions; participants with mild depression required monitoring and repeat of PHQ-9 administrations at follow-up visit; participants with moderate depression required counselling and/or pharmacotherapy; participants with moderately severe depression required immediate initiation of pharmacotherapy and/or psychotherapy, and participants with severe depression required immediate pharmacological

intervention and psychotherapy especially if there is no improvement with monotherapy (Kroenke & Spitzer, 2002).

Outcome measured.

The main outcome measure of this project is the detection of depression among PLWHA using a depression screening tool. The outcome was measured using a depression screening tool known as PHQ-9.

The PHQ-9(Appendix E) was used as a screening tool for depression. PHQ-9 is a 9- item depression screening tool developed by Kroenke, Spitzer, and Williams (2001) for screening and measuring the severity of depression. It is a self-administered questionnaire which scores each of the nine Diagnostic and Statistical Manual of Mental Disorder- 5 (DSM-5) criteria as “0” (not at all) to “3” (nearly every day) for the survey items during the past two weeks. A patient is diagnosed with major depression if five or more of the nine depressive symptoms criteria have been present at least “more than half the days” in the past two weeks, and one of the symptoms is depressed mood or anhedonia. The PHQ-9 score ranges from 0-27 and symptoms are rated as follows: minimal (0-4), mild (5-9), moderate (10-14), moderately severe (15-19), and severe (20-29).

Kroenke and Spitzer (2002) found that at cut off score of 10 or greater, PHQ-9 has a sensitivity of 88% and specificity of 88% for major depression. Indu et al., (2018) also found that PHQ-9 tool had a high internal consistency reliability and inter-rater reliability of 0.89 and 0.94 respectively. The PHQ-9 tool is a valid tool for evaluating patients for depression with a variable sensitivity (27%-91.6%) and a high specificity (70.8%-95.6) (Bernard, Dabis, & de Rekeneire, 2017). Several studies have also demonstrated the validity of PHQ-9 in identifying depression

among PLWH (Cholera et al., 2014; Gelaye et al., 2013; Edwards, et al., 2014; Bhana, Rathod, Selohilwe, Kathree, & Petersen, 2015; Bernard, Dabis, & de Rekeneire, 2017).

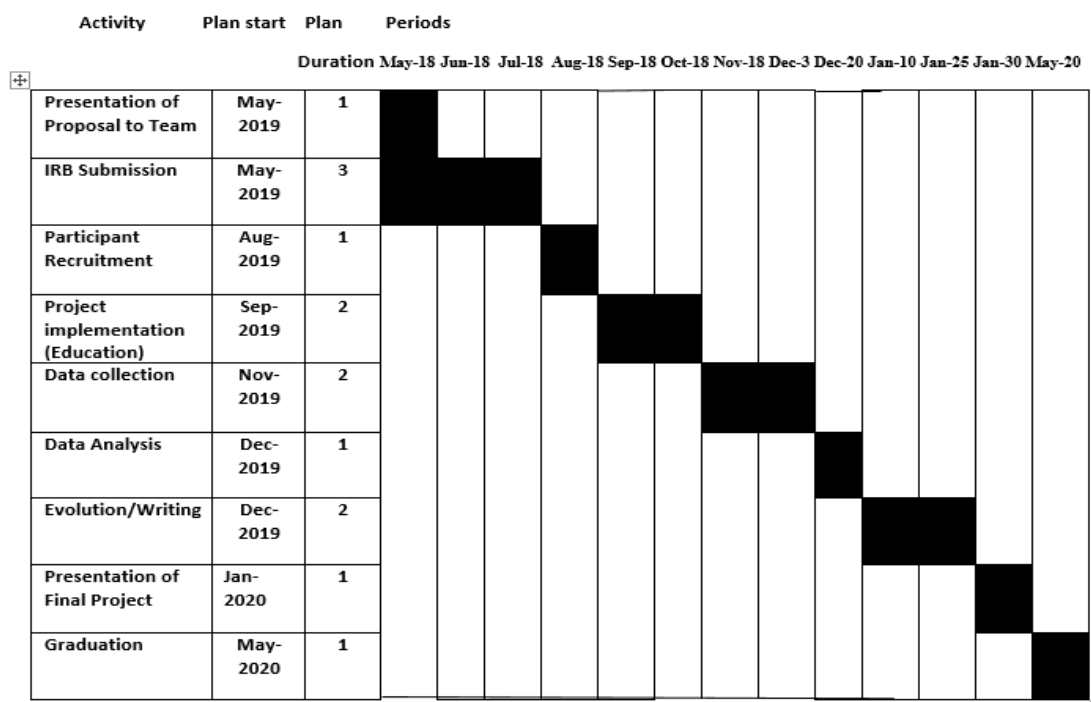
PHQ-9 is a brief depression assessment tool that is highly recommended by U.S Department of Veterans Affairs (2018) for assessing and identifying depression among PLWH. PHQ-9 is free for public use, easy to understand and simple to score, and it has been validated across diverse patient population including African Americans, Chinese Americans, Latinos, and non-Hispanic whites (Kinney & Cournos, 2017).

The demographic data to be collected included: age, gender, ethnicity, educational level, income level, employment status, marital status, and health insurance status. A copy of demographic survey is located in appendix F.

Project timeline.

Project timeline is located in Appendix J and shown below.

Project Timeline



Resources needed/economic considerations (project budget).

The cost associated for this project was the sole responsibility of the project managers. Costs included recruitment materials (flyers, PHQ-9 questionnaires, and demographic surveys), storage flash drive, scanning data, statistical consultation, cash gifts, and transportation. The budget for this project is located in appendix L.

Evaluation

The project assessed the following outcomes:

- i) The prevalence of depression among PLHWA in a comprehensive a HIV care setting.
- ii) The differences in PHQ-9 scores within the sociodemographic subgroups in a comprehensive HIV care setting

Data maintenance/Security

Information collected from participants was used strictly for the purpose of this project and are kept securely in a lock and key cabinet within the project site. Collected data was only accessible to the study personnel. Upon completion of the project, closure of the IRB, and final writing of the manuscript all data will be maintained by the study team for 6 years in accordance with Rutgers University guidelines. Hard copies of consents and aggregate data will be kept in locked cabinet at Rutgers University for a maximum period of six years.

Data Analysis.

The data collected from PHQ-9 questionnaire and the sociodemographic data were analyzed using descriptive statistics and nonparametric statistics (Kruskal-Wallis Test) with the use of Statistical Package for the Social Sciences (SPSS) latest version at the time of the project. Descriptive analyses were reported as frequencies and proportions.

Findings

Results

PHQ 9 screening tool was administered to 32 participants (Table 1). Out of the 23 participants screened for depression, 18(78.3%) were within the age group of 40-60 years. Majority of the participants were Black or African American, 15(65.2%), male 16 (69.6%), and single 18(78.3%). Most of the participants had High School diploma or equivalent (GED) 9 (39.1%), 13(56.5%) were unemployed and 19 (82.6%) out of the 23 participants had an income level of less than \$20,000.

Table 1

Sociodemographic data of participants who were screened for depression using PHQ-9

Sociodemographic	Frequency (f)	Percentage (%)
Age (years)		
18-39	2	8.7
40-60	18	78.3
61-89	3	13.0
Total	23	100
Race		
American Indian or Alaska Native	3	13.0
Black or African American	15	65.2
White	2	8.7
Hispanic	3	13.0
Total	23	100
Gender		
Male	16	69.6
Female	6	26.1
Other	1	4.3
Employment Status		
Employed	3	13.0
Unemployed	13	56.5
Retired	2	8.7
Unable to work	5	21.8
Total	23	100

Marital Status		
Single (never married)	18	78.3
Married, or in a domestic partnership	3	18.0
Widowed	1	4.3
Divorced/separated	1	4.3
Total	23	100
Education level		
Less than a high school diploma	8	34.8
High school degree or equivalent (e.g. GED)	9	39.1
Some college, no degree	5	21.7
Associate degree/Bachelors	1	4.3
Total	23	100
Income level		
Less than \$20,000	19	82.6
\$21,000 to \$40,000	2	8.7
\$41,000 to \$60,000	2	8.7
Total	23	100
Insurance		
Government funding	19	82.6
Self-Pay, Out of pocket	4	17.4
Total	23	100

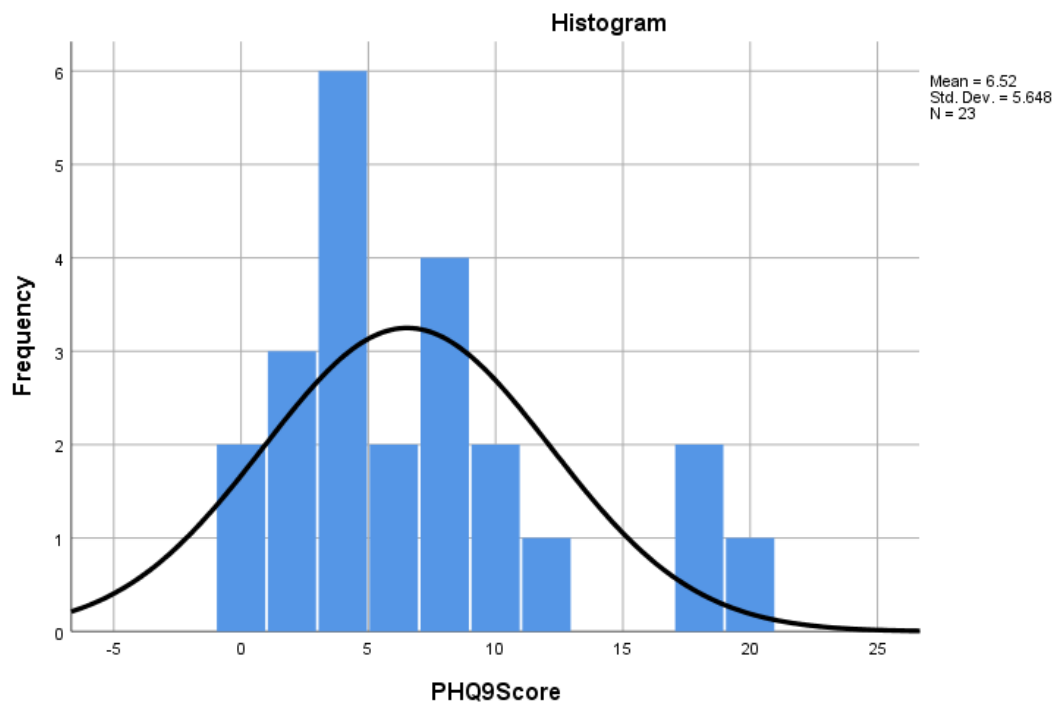
Out of the 23 participants who were screened for depression using the PHQ-9, 11 (47.8%) scored from 0 to 4 and 8(34.9%) of participants scored from 5 to 9 which indicates possible minimal and mild depression respectively. One participant scored 12 which is within the range of 10 to 14 (moderate depression), and 3(13.0%) participants were in the category of moderately severe depression (a score from 15 to 19) as indicated in Table 2. None of the participants had a score within the range of 20 to 27 (severe depression). The overall mean PHQ-9 score was 6.52(S.D 5.65) as indicated in figure 1.

Table 2

Distribution of PHQ-9 scores according to levels of severity

Depression category	Frequency (f)	Percentage (%)
Minimal depression	11	47.8
Mild depression	8	34.9
Moderate depression	1	4.3
Moderately severe depression	3	13.0
Total	23	100

Figure 1. Histogram representing the distribution of PHQ-9 scores



In this study, depression was determined by PHQ-9 score greater than or equal to 5.

Based on the PHQ-9 cut-off point of ≥ 5 , twelve (52.2%) of the total participants ($n=23$) met the criteria for possible depression. Mild depression ($\text{PHQ } 9 \geq 5$) was present in 8 (66.7%) participants; 1 (8.3%) met the criteria for moderate depression ($\text{PHQ } 9 \geq 10$), while 3 participants met the criteria for moderately severe depression ($\text{PHQ } 9 \geq 15$). None of the

participants screened positive for severe depression (Table 3). Additionally, none of the participants scored a point for question on suicidality (thoughts that you would be better off dead or of hurting self in some way).

Table 3

Distribution of PHQ-9 scores ≥ 5

Depression category	Frequency (f)	Percentage (%)
Mild depression	8	66.7
Moderate depression	1	8.3
Moderately severe depression	3	25.0
Total	12	100

In Table 4, seventeen (73.9%) of the 23 participants reported no level of functional impairment associated with their depression level, 4(17.4%) participants expressed somewhat level of functional difficulties while 2(8.7%) participants reported very difficult level of functionality associated with their depression level.

Table 4

Distribution of PHQ-9 according to level of difficulty

Level of difficulty	Frequency (f)	Percentage (%)
Not difficult at all	17	73.9
Somewhat difficult	4	17.4
Very difficult	2	8.7
Total	23	100

The majority of 12 participants with a PHQ9 score ≥ 5 were within the age group of 40-60 years, Black or African American, male, and single with percentage scores of 91.7%, 66.7%, 66.7% and 75% respectively. Five (41.7%) of the participants had High School diploma or

equivalent (GED), 6 (50%) participants were unemployed while 9(75%) of participants had income level less than \$20,000. Ten (83.3%) of the participants with PHQ9 score ≥ 5 had government funding (Medicare, Medicaid) as indicated in Table 5.

Table 5

Sociodemographic data and PHQ-9 score ≥ 5

Sociodemographic	Frequency (f)	Percentage (%)
Age (years)		
18-39	1	8.3
40-60	11	91.7
61-89	0	0.0
Total	12	100
Race		
American Indian or Alaska Native	1	8.3
Black or African American	8	66.7
White	1	8.3
Hispanic	2	16.7
Total	12	100
Gender		
Male	8	66.7
Female	3	25.0
Other	1	8.3
Total	12	100
Employment Status		
Employed	2	16.7
Unemployed	6	50
Retired	0	0
Unable to work	4	33.3
Total	12	100
Marital Status		
Single (never married)	9	75.0
Married, or in a domestic partnership	2	16.7
Widowed	0	0.0
Divorced/separated	1	8.3
Total	12	100
Education level		
Less than a high school diploma	4	33.3
High school diploma or equivalent (e.g. GED)	5	41.7
Some college, no degree	2	16.7
Associate degree/Bachelors	1	8.3
Total	12	100
Income level		

Less than \$20,000	9	75.0
\$21,000 to \$40,000	0	0.0
\$41,000 to \$60,000	3	25.0
Total	12	100
Insurance		
Government funding	10	83.3
Self-Pay, Out of pocket	2	16.7
Total	12	100

The Kruskal-Wallis test was used to analyze the differences among each of the sub-groups within the sociodemographic factors (Table 6). The analysis showed that PHQ9 scores differed significantly with the level of functional difficulty ($H(2) = 7.993, p=.018$) with a mean rank of 9.74 for “not difficult at all”, 6.88 for “somewhat difficult”, and 21.50 for “very difficult”. However, the PHQ9 scores were not statistically different among the sociodemographic sub-groups within the age, gender, race, employment, education level, marital status, income level and health insurance ($H(2) = .792, .073, 1.487, 1.382, .953, .373, 3.704$, and $.135$; $p = .673, .964, .685, .710, .813, .157$, and $.713$ respectively)

Table 6

Test of differences between PHQ9 scores and sociodemographic data

Variable combination	Kruskal-Wallis (H)	<i>p</i> -value
PHQ9 score and Age	.792	.673
PHQ9 score and Gender	.073	.964
PHQ9 score and Race	1.487	.685
PHQ9 score and Employment	1.382	.710
PHQ9 score and Education level	.953	.813
PHQ9 score and Marital status	.373	.946
PHQ9 score and Income level	3.704	.157
PHQ9 score and Insurance	.135	.713
PHQ9 score and Level of Difficulty	7.993	.018

Note: * $p < 0.05$

Recommendation and Discussion

Our study focused on implementing the use of PHQ-9 depression screening tool among PLWHA in a comprehensive care setting. PHQ-9 is a 9- item self-administered questionnaire developed by Kroenke, Spitzer, and Williams (2001) for screening and measuring the severity of depression. In this present study, the PHQ-9 screening tool was able to identify depression among PLWHA in a long-term HIV care setting. Unlike our study, which was conducted in a long-term HIV care setting, other studies on HIV and depression using the PHQ-9 were conducted mostly in HIV outpatient clinics or HIV hospital units (Edwards, et al., 2014; Chenneville, Gabbidon, Drake & Rodriguez, 2019; Kulisewa, et al, 2019).

Depression in our study was found among 52.2% of the participants who completed the PHQ-9 screening tool based on PHQ-9 score of ≥ 5 . Nine of the total study population (n=32) were already diagnosed with depression and are receiving treatment for depression; therefore, the preliminary prevalence of depression in the study population is 28%. High prevalence of depression among people living with HIV/AIDS has been reported from other studies. Shittu et al. (2013), in Northern Central Nigeria reported that (56.7%) of 170 participants satisfied the criteria for a depressive disorder using the PHQ-9 score in their study. Similarly, Bhatia and Munjal (2014) also found out that the prevalence of depression in patients with HIV who were undergoing treatment was 58.75%. They established high prevalence of depression among the uneducated and people with poor social support; however, in our study, depression was more prevalent in participants with a high school diploma (41.7%).

Out of 130 participants in the study conducted by Obadeji, Ogunlesi, and Adebowale, (2014) using PHQ-9 screening tool, 46.7%, 50%, 3.3% were mildly, moderately and severely depressed respectively. Unlike our study where the majority of the participants who met the

criteria for depression ($\text{PHQ-9} \geq 5$) were within the age group of 40-60 years (91.7%), predominantly males (66.7%), and single/never married (75%), the study conducted by Obadeji, Ogunlesi, and Adebawale (2014) reported that the majority of the participants fell within the age group of 30-39 years (40%), and women accounted for 69.2% of the study population, while 46.9% of the participants were either divorced/separated or widowed. The study setting was a long-term facility comprising individuals in their middle and late adulthood with average age 42.5 years. Seventy-five percent (75%) of the population were males, and most of them were single or never married. This may have accounted for the recorded characteristics in age, gender and marital status in our study.

The prevalence of depression among PLHIV was 39.6% in the study conducted by Adeoti, Dada, & Fadare, (2018). The result showed that being unemployed, and having a status of low education level and low income level, were associated with a high level of depression. Similarly, in our study, 9 (75%) participants with a $\text{PHQ-9} \geq 5$ score had an annual income level below \$20,000; six (50%) of them were unemployed while 10 (83.3%) of the participants solely depend on the government (Medicare and Medicaid) for assistance with treatment.

The prevalence of depression among PLWHA remains higher than that of the general population. The preliminary prevalence of depression among PLWHA in this study (28%) was higher than that of the general adult population in Essex County (11.2%), State of New Jersey (14.8%) and the entire nation (7.1%) in 2017 (New Jersey State Health Assessment Data, 2017; National Institute of Mental Health 2019).

The total PHQ-9 scores were significantly different among the level of functional impairment expressed by participants; however, there was no significant difference between PHQ-9 total scores and the sociodemographic sub-groups including age, gender, race,

employment, education level, marital status, income level and health insurance. It is expected that the level of functional difficulty should increase with higher PHQ-9 scores; however, the difference in level of functional impairment reported by the participants is not solely a function of the depressive symptoms but could be related to the progression of the disease. For instance, three participants in the study had scores indicating moderately severe depression but only two of them reported “very difficult” with their level of functioning and the remaining one participant in the same category reported “not difficult at all” with level of functioning. Similarly, some participants with PHQ9 score in the category of mild and moderate depression reported experiencing “somewhat difficulty” with their level of functioning while one person among the study with a PHQ9 score as low as 6 (mild depression) reported the effects of depressive symptoms on level of functionality as “very difficult”. This finding may further buttress the fact that the PHQ-9 scores do not exclusively determine the level of functioning of an individual with depressive symptoms.

It was also observed in the study that most participants were dependent on assistive devices such as wheelchairs, walkers, and canes for mobility. It is therefore pertinent that clinicians should be guided by their clinical judgment in diagnosing depression, since PHQ9 is only a screening tool and not a conclusive diagnostic tool.

The total PHQ9 scores were not significantly different among the sociodemographic sub-groups within age, gender, race, employment, education level, marital status, income level, and health insurance ($p = .673, .964, .685, .710, .813, .157, \text{ and } .713$ respectively), this may be attributable to the small sample size (23). Sullivan & Feinn (2012) suggests that in order to find statistical difference while carrying out a study, it is pertinent to increase the sample size. Besides, the homogeneity of the population distribution in the project site may have affected the

level of significance within the subgroups. The population of study were not diversely distributed. About 75% of the patient in the study site were males, 85% were African America, and 52% were within the age group of 35 to 50 years. This pattern may have accounted for the high number of males (69.9%), African American (65.2%) and participants aged 40 to 60 (78.8%) seen in the study. Additionally, the location of the site may have constituted a contributory factor to the lack of diversity in the distribution of the study population. The study site is located at the heart of Newark NJ which is highly dominated by African Americans. According to the US Census Bureau (2019), African American constitutes 50% of the entire Newark NJ population compared to the national population of 13.4%, and the New Jersey Department of Health (2018), reports that African American constitutes 78% of the HIV distribution by race.

One of the limitations of this study is the small sample size ($n=23$). The sample size is not enough to establish validity and generalizability of the result. The study was conducted using a cross-sectional design, so inference about causality between depression and HIV/AIDS cannot be established; besides, the study was conducted in a long-term HIV care facility with limited diversity in the population characteristics. The study site was dominated by males, African Americans, individuals with low income who are dependent on government funding (Medicare, Medicaid) for treatment, and individuals within similar age groups. We recommend that further studies on the use of PHQ-9 screening tool should could be conducted in multiple HIV care settings including outpatient clinics, integrated care settings, and hospital HIV units. We also recommend conducting a study that compares the prevalence of depression among PLWHA in a long-term HIV care setting and outpatient HIV care setting.

Economic/cost benefits

PLWHA who suffer from depression are likely to be less motivated to seek for job or retain jobs, leading to decreased income capacity and reduced work productivity. Early detection of depression among PLWHA through routine depression screening will help them obtain suitable care required to function optimally at home and at work. HIV/AIDS constitutes a significant financial burden on both the government and individual households. As of 2015, the estimated lifetime medical cost of caring for an HIV infected individual at age 35 years was \$326,500, which is three times higher than that of an uninfected individual of the same age (Schackman et al., 2015). The economic drain on the federal government arising from expenditure on HIV/AIDS care could be huge. For instance, in 2016 fiscal year alone, the State of New Jersey allocated \$2,222,710 of the HIV/AIDS federal funding (\$113,486,362) to substance abuse and mental health services of PLWHA (AIDSVU, 2019). Early detection of depression and subsequent depression treatment as part of the routine mental health services provided to PLWHA could be one of the great steps taken to offset these financial and other burdens incurred by the government and the patient on a yearly basis.

Impact on healthcare quality and safety

The outcome of this study suggests that depression is a common psychiatric disorder among PLWHA. The PHQ-9 depression screening tool was able to identify PLWHA who are at risk for depression, therefore, depression screening should be made a standardized clinical routine practice in every HIV care setting. Screening for depression among PLWHA is important to enhance referral and management of HIV care. Patients who are found to have any form of depression should be referred to mental healthcare providers for further evaluation and treatment for attainment of better clinical outcomes. Depression could become a strong predictor of poor

clinical outcomes among PLWHA, therefore, when depression is not identified and treated properly, it can impede HIV care including but not limited to medication adherence, retention in HIV care, motivation to participate in activities of their daily living, risky health behaviors (substance abuse, indiscriminate sexual acts, etc.), increase in viral load and mortality rate.

People living with HIV/AIDS (PLWHA) were found to be at risk for depression as seen in our study, however depression screening among PLWHA is not a common practice in HIV care settings. Many clinicians often neglect to assess patients for depressive symptoms including suicidal thoughts and behaviors on routine basis. Routine depression screening will help clinicians identify patient who are at risk for depression and refer them for further diagnostic evaluation. Studies have shown that depression interferes with the quality of life of PLWH including high risk of HIV acquisition, noncompliance with antiretroviral therapy (ART) regimen, and inability to attain viral suppression (Uthman, Magidson, Safren, & Nachega, 2014; U.S. Department of Veterans Affairs, 2018). Early detection of depression among PLWHA is necessary to maintain the HIV treatment cascade for better clinical outcome and prevent recurrent hospitalization that may result from opportunistic infections. It is also expected that early identification of depression and treatment will increase life expectancy, treatment adherence and decrease the risk of suicide among PLHWA.

Policy implications

The United States Preventive Services Task Force (USPSTF) (2016) recommends screening for depression in general adult population “with adequate system in place to ensure accurate diagnosis, effective treatment and appropriate follow up”. This recommendation is in line with the HIV care policy mapped out by the 2013 Primary Care Guidelines for the Management of Persons with HIV which states that medical providers should assess for

depression using direct questions or validated screening tools at the initial medical visit and at subsequent periodic intervals (Kinney & Cournos, 2017). In this study, we utilized the PHQ9, a well validated depression screening tool to assess for depression among PLWHA. The result of the study showed that PLHWA are at risk for depression, and that depression can affect their level of functionality. In the state of New Jersey, depression is one of the mental health contextual problems identified by the New Jersey HIV Planning Group (NJHPG) as impeding the attainment of zero new HIV infection in New Jersey by the year 2020 (Integrated HIV Prevention and Care Plan 2017-2021 Update, 2018). The implementation of the use of depression screening tool as part of standard HIV care will help address the issues of undiagnosed or untreated depression among PLWHA leading to improved clinical outcome and minimization of HIV transmission by year 2020.

Education

PHQ-9 should be incorporated in the teaching and training of healthcare professionals. Every healthcare professional should not only be knowledgeable of PHQ9 depression screening tool, but also be prepared to utilize it on routine bases in their various clinical practice. Assessment of depression should not be viewed as a sole responsibility of mental health professionals since depression can interfere with care of people suffering from chronic illnesses including HIV/AIDS.

Translation

In order to ensure sustainability, the project managers will share the findings of this project with stake holders of the study facility and encourage them to consider the inclusion of the PHQ-9 depression screening tool into their monthly assessment package. Some identified organizational forces that may constitute possible potential barriers to the implementation of the

use of PHQ9 screening tool include: lack of knowledge of the importance of depression screening, limited number of staff members, lack of time and capacity, language barrier, limited knowledge of PHQ-9 screening tool, staff resistance to change and bureaucracy in management. The project managers will explore the barriers to adoption of the use PHQ9 depression screening tool on routine basis in their practice and seek to resolve such barriers in collaboration with the facility management.

Dissemination.

The outcome of this project will be disseminated beyond the long-term care HIV/AIDS facility where the project was conducted. It is critical to share the implication of this study on clinical practice, quality and safety of HIV care, and the cost of HIV with the facility management and staff.

Professional Reporting

Efforts will be made to organize workshops and seminars on the need for the use of validated depression screening tool as part of standard HIV care in HIV care organizations, facilities, and clinics across New Jersey and beyond. The investigators will submit the project's abstract and statistics to the Journal of Psychiatric and Mental Health Nursing, and other related professional journals for professional reporting. The outcome of this project will be disseminated through scholarly posters and formal presentations.

Summary

Depression remains one of the most common psychiatric disorder associated with HIV/AIDS. This project study aimed at implementing the use of depression screening tool (PHQ-9) in a HIV care setting with the primary purpose of detecting depression among PLWHA. The study involved the collection of sociodemographic data of the participants and estimated the

prevalence of the sociodemographic factors and depression among PLWHA. PHQ-9 screening tool was able to identify some depressive symptoms among PLWHA in a long-term HIV care setting. Undiagnosed or under-diagnosed depression can impede better clinical outcomes of HIV care. It is therefore, recommended that depression screening should become a routine practice in every HIV care settings and primary care facilities. The integration of depression screening into HIV care continuum is expected to not only promote retention and engagement in HIV care but also improve HIV treatment outcomes including antiretroviral therapy (ART) adherence and viral suppression.

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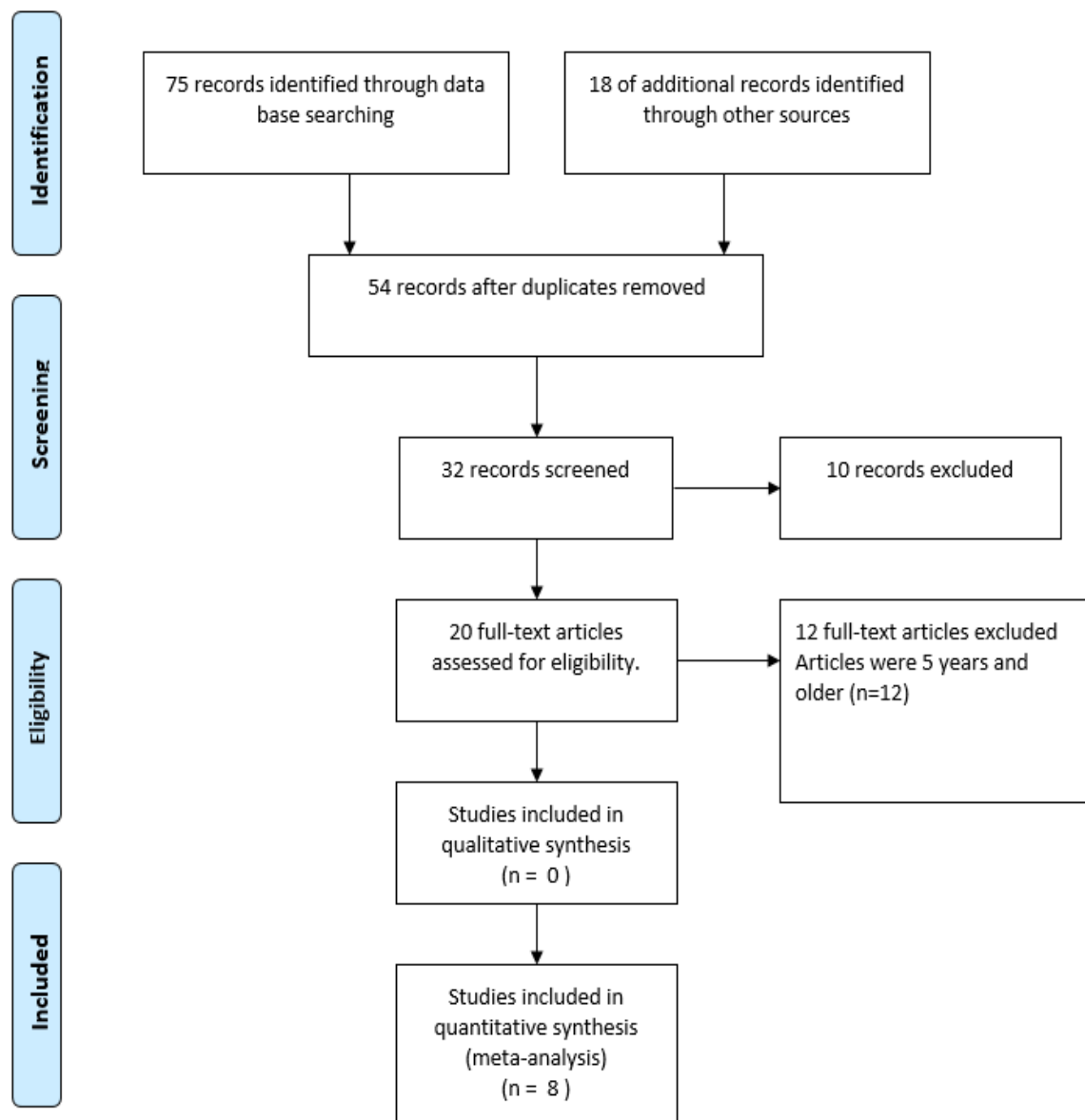
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Appendix C

PRISMA Flow Chart diagram



Appendix D

Evidence Table

Article #	Author & Date	Evidence Type	Sample, Sample size, setting	Study findings	Limitations	Evidence level & Quality
1	Ahaneku et al., (2016)	Quantitative	Respondent driven sampling. Three hundred participants (HIV positive Men who have sex with Men) from two cities in Tanzania, East Africa.	The study showed that 46.3% of the participants suffered depression. Depression was assessed using PHQ-9. Self-identification as gay, having multiple sexual partners, being HIV positive, physical and verbal abuse from family and partners were associated with high prevalence of depression.	Inability to establish causal relationship between depression and associated factors, reporting and recall bias were identified as limitations.	Level III Grade B.
2	Arseniou, Arvaniti & Samakouri (2014).	Systematic review.	447 Articles were reviewed in Greece	Biological factors such as alteration in white matter, psychosocial factors such as stigma, body image, isolation, history of comorbid psychiatric illnesses, and perinatal period in women with HIV are all predictors of depression	Factors such as alterations in the white matter in the brain could be due to the direct infection of the HIV and not due to the depression	Level III Grade B
3	Asangbeh, Sobngwi, Ekali, Eyoum, & Msellati, (2016)	Quantitative	Convenience sampling. 202 participants in a Hospital located at West Cameroon, Central Africa	The study identified over 35.2 % of the total participants with depression. The predictors of depressive symptoms include: monthly income of less than (\$40), presence of HIV/AIDS symptoms, and CD4 count less than 200.	The study was not able to establish a causal relationship between predictors of depression and prevalence of depression among PLWHA. The study was conducted among PLWHA who are undergoing ART.	

4	Bengston et al., (2019)	Quantitative	Convenience sampling. 1057 HIV positive adults from Center for AIDS Research Network of Integrated Clinics(CNICS) system across USA	Thirty percent of the participants reported depressive symptoms at the initiation of ART. Depressive symptoms were found to be a risk factor for increase in viral loads.	Limited information on counselling or other behavioral health assistance. Volunteer bias. The study also lacked generalizability	Level III Grade B
5	Beyene et al., (2019)	Quantitative	Systematic random sampling method. 411 adult participants from ART clinics in Aksum Ethiopia, East Africa.	The study identified relatively low degree of depression (14.6%) among participants of this study. Factors such as living alone, nonadherence to ART, eating two meals per day or less, history of ART side effects and being on HIV/AIDS WHO stage II or above were associated with depression.	Self-report depression symptoms	Level III Grade B
6	Deshmukh, Borkar & Deshmukh(2017).	Quantitative	Convenience Sampling. 754 participants 18 years and older in a tertiary hospital locate in Central Idea.	Using Depression, Anxiety, Stress subscales, and full Scale (DASS-21) the study found that Fifty percent (50%) of the studied participants suffered depression. Women, illiterates and unemployed participants had high prevalence of depression. The quality of life (QOL) was lower in patient who suffered depression than those who had no depressive symptoms.	It was difficult to explain whether depression preceded or succeeded the associating factors mentioned in the findings.	Level III Grade B
7	Sowa, Bengtson, Gaynes,& Pence (2015)	Quantitative	Simple random sampling. 149 participants. The study was done	With the PHQ9, participant who had depression with comorbid anxiety	Diagnosis was based on PHQ9 without corresponding	Level I Grade B

			in North Carolina USA.	with or without substance use, had slower time to remission when treated with antidepressants.	standard diagnostic criteria.	
8	Tao et al., (2017)	Quantitative	Simple random sample and 445 participants drawn from Beijing, China.	Depression and anxiety are risk factors of ART non adherence among MSM with HIV and prolongation of viral suppression.	MSM were recruited from a single metropolitan city in Beijing and the results cannot be generalized. 21% of the participants missed at least one visit and ART adherence was self-report and they could be bias	Level I Grade B
9	Wang et al., (2018)	Systematic review	A systemic literature search of databases on depression and depressive symptoms among People Living with HIV/AIDS (PLWHA) in China. 20,635 participants from the searched literature were included in the study.	There is a significant prevalence of depression and depressive symptoms among general people living with AIDS, HIV positive men who have sex with men, HIV positive persons who were blood/plasma donors and among HIV positive population as indicated by 50.8%, 43.9%, 85.6%, and 51.6% incidence respectively.	Presence of significant heterogeneity in the prevalence estimates across the researched studies on depression and depressive symptoms among PLWHA.	Level III Grade B

Appendix E

Patient Health Questionnaire -9 (PHQ-9)

PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

DATE: _____

Over the last 2 weeks, how often have you been
bothered by any of the following problems?
(use "✓" to indicate your answer)

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3

add columns + +

(Healthcare professional: For interpretation of TOTAL, TOTAL:
please refer to accompanying scoring card).

10. If you checked off <i>any</i> problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	Not difficult at all	_____
	Somewhat difficult	_____
	Very difficult	_____
	Extremely difficult	_____

Appendix F

Sociodemographic Questionnaire

SOCIODEMOGRAPHIC QUESTIONNAIRE

1

Sociodemographic Questionnaire

Please answer all questions honestly, your responses are totally anonymous.

1. What is your age?

18-39 years old ☐

40- 60 years old ☐

60 -89years ☐

2. How would you describe yourself?

- American Indian or Alaska Native ☐
- Asian ☐
- Black or African American ☐
- Native Hawaiian or Other Pacific Islander ☐
- White ☐

3. What is your gender? Male ☐ Female ☐ Other ☐

4. What is your marital status?

- Single (never married) ☐
- Married, or in a domestic partnership ☐
- Widowed ☐
- Divorced ☐
- Separated ☐

SOCIODEMOGRAPHIC QUESTIONNAIRE

2

5. What is the highest degree or level of school you have completed?

- Less than a high school diploma ☐
- High school degree or equivalent (e.g. GED) ☐
- Some college, no degree ☐
- Associate degree (e.g. AA, AS) ☐
- Bachelor's degree (e.g. BA, BS) ☐
- Master's degree (e.g. MA, MS, MEd) ☐
- Doctorate (e.g. PhD, EdD) ☐

6. What is your current employment status?

- Employed ☐
- Unemployed ☐
- Student ☐
- Retired ☐
- Homemaker ☐
- Self-employed ☐
- Unable to work ☐

7. How much is your total income per year?

- Less than \$20,000 ☐
- \$21,000 to \$40,000 ☐
- \$41,000 to \$60,000 ☐
- \$61,000 to \$80,000 ☐
- \$81,000 to \$100,000 ☐
- Over \$100,000 ☐

8. How do you pay for your healthcare?

- Government funding (Medicare, Medicaid, ADAP, Ryan White, VA etc) ☐
- Private Insurance ☐
- Self-Pay, Out of pocket ☐

Appendix H Consent Form



Rutgers School of Nursing
Stanley S. Bergen Building
Rutgers, The State University of New Jersey
65 Bergen Street
Newark, NJ 07101-1709

CONSENT TO TAKE PART IN A RESEARCH STUDY

TITLE OF STUDY: Implementation of the use of Depression Screening Tool in a HIV care Setting

Principal Investigator: Dr. Gerti E. Heider, PhD, MSN, GNP-BC, ANP, APN

This consent form is part of an informed consent process for a research study and it will provide information that will help you decide whether you want to take part in this study. It is your choice to take part or not. After all of your questions have been answered and you wish to take part in the research study, you will be asked to sign this consent form. You will be given a copy of the signed form to keep. Your alternative to taking part in the research is not to take part in it.

Who is conducting this research study and what is it about?

You are being asked to take part in research being conducted by Gerti E. Heider who is an Associate Professor in the Dept. of Nursing, Division of Advanced Nursing Practice/Gerontology, Adult Health, Sexuality in older women, HIV in older adults and chronic diseases. The purpose of this study is to identify depression in People Living with HIV/AIDS (PLWHA) using a validated depression screening tool known as Patient Health Questionnaire (PHQ-9). The project aims to establish the need for depression screening among PLWHA in a HIV care setting.

What will I be asked to do if I take part?

The *questionnaire and survey* will take about 20 minutes to complete it. We anticipate *about 40* subjects will take part in the study.

What are the risks and/or discomforts I might experience if I take part in the study?

Breach of confidentiality is a risk of harm, but a data security plan is in place to minimize such a risk. Also, some questions may make you feel uncomfortable. If that happens, you can skip those questions or withdraw from the study altogether. If you decide to quit at any time before you have finished the survey or questionnaire your answers will NOT be recorded.

Are there any benefits to me if I choose to take part in this study?

There no direct benefits to you for taking part in this research. You will be contributing to knowledge about how depression screening among PLWHA will improve care outcome.

Will I be paid to take part in this study?

A cash gift of \$5 will be given to each subject who participates in the study.

How will information about me be kept private or confidential?

All efforts will be made to keep your responses confidential, but total confidentiality cannot be guaranteed. We will not collect any information that can identify you or other subjects. Completed forms will be stored in a locked cabinet controlled by the investigator. Responses may be converted to digital format and stored on a password-protected computer that can only be

Page 1 of 3
ICF version [06.22.19]

accessed by the study team. Paper copies will then be destroyed. We plan to delete the data Upon completion of the project, closure of the IRB, and final writing of the manuscript all data will be destroyed in accordance with Rutgers University guidelines. Hard copies of consents and aggregate data will be kept in locked cabinet at Rutgers University for a maximum period of six years. No information that can identify you will appear in any professional presentation or publication.

What will happen to information I provide in the research after the study is over?

The information collected about you for this research will not be used by or distributed to investigators for other research.

What will happen if I do not want to take part or decide later not to stay in the study?

Your participation is voluntary. If you choose to take part now, you may change your mind and withdraw later. You may leave without turning in a completed form or by turning in a blank or incomplete form. However, once you turn in the form, you can no longer withdraw your responses as we will not know which ones are yours.

Who can I call if I have questions?

If you have questions about taking part in this study, you can contact the Principal Investigator: Dr. Gerti E. Heider at [REDACTED]

If you have questions about your rights as a research subject, you can call the IRB Director at: *Newark HealthSci* (973)-972-3608 or the Rutgers Human Subjects Protection Program at (973) 972-1149.

Please keep this consent form if you would like a copy of it for your files.

SIGNATURE SECTION OPTIONS

(1) **Subject's written signature is NOT required:**

By beginning this research, you acknowledge that you have read the information and agree to take part in the research, with the knowledge that you are free to withdraw your participation without penalty.

SIGNATURE SECTION OPTIONS:

AGREEMENT TO PARTICIPATE

1. Subject consent:

I have read this entire consent form, or it has been read to me, and I believe that I understand what has been discussed. All of my questions about this form and this study have been answered. I agree to take part in this study.

Subject Name (printed): _____

Subject Signature: _____ Date: _____

2. Signature of Investigator/Individual Obtaining Consent:

To the best of my ability, I have explained and discussed all the important details about the study including all of the information contained in this consent form.

Investigator/Person Obtaining Consent (printed): _____

Signature: _____ Date: _____

Subject's signature IS REQUIRED:

Appendix I

FLYER



Rutgers School of Nursing
Stanley S. Bergen Building
Rutgers, The State University of New Jersey
65 Bergen Street
Newark, NJ 07101-1709

Invitation to Participate in a Research Study Topic: Depression Screening for People Living With HIV/AIDS

Principal Investigator: Dr. Gerti E. Heider, PhD, MSN, GNP-BC, ANP, APN

Research Purpose: To identify depression in People Living with HIV/AIDS (PLWHA) using a depression screening tool (Patient Health Questionnaire -PHQ-9).

Eligibility: People Living with HIV/AIDS who are 18 years and above, who can understand English language, and are not seeing a Mental Health Provider for depression treatment.

Benefits: Detection of depression, and/or recommendation to see a Mental Health Provider for further evaluation.

Study Activities: Each participant will complete a Sociodemographic survey and Patient Health Questionnaire-9 (PHQ-9) tools.

Estimated Study commitment time per participant: 30 minutes

Incentive: \$5 cash will be given to each participant upon completion of the study activities.

Location: [REDACTED]

Date: August, 2019 to October, 2019.

Time: 10am -12pm (Monday to Saturday)

Contacts:

Kenneth Ogali: Rutgers Graduate School of Nursing, Newark NJ or [REDACTED]
Firmin Langvin: Rutgers Graduate School of Nursing, Newark NJ or [REDACTED]

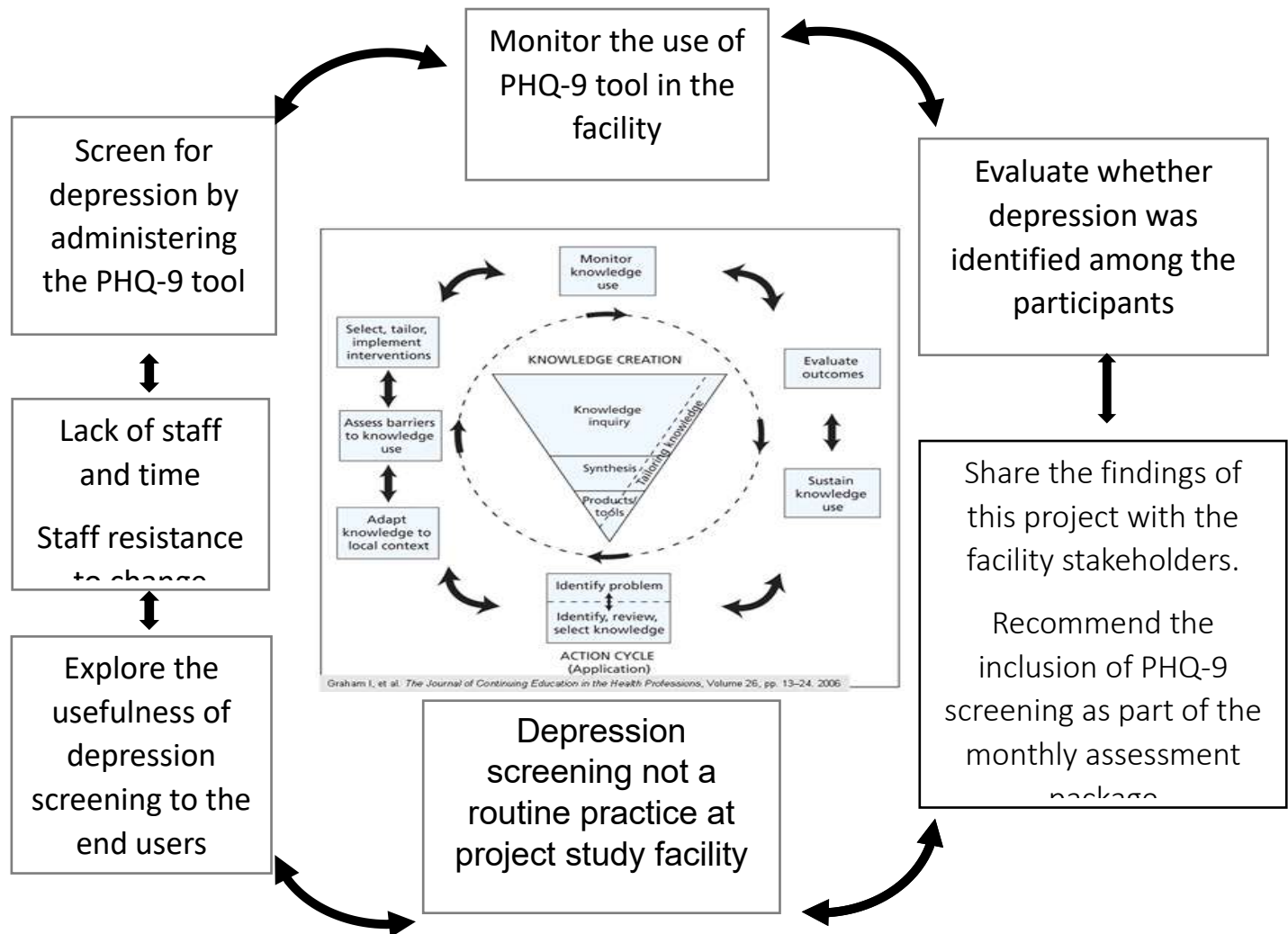
7/29/2019 Version 3.

Project Timeline

Activity	Plan start	Plan	Periods
			Duration May-18 Jun-18 Jul-18 Aug-18 Sep-18 Oct-18 Nov-18 Dec-3 Dec-20 Jan-10 Jan-25 Jan-30 May-20
Presentation of Proposal to Team	May-2019	1	■
IRB Submission	May-2019	3	■ ■ ■
Participant Recruitment	Aug-2019	1	■
Project implementation (Education)	Sep-2019	2	■ ■
Data collection	Nov-2019	2	■ ■
Data Analysis	Dec-2019	1	■
Evolution/Writing	Dec-2019	2	■ ■
Presentation of Final Project	Jan-2020	1	■
Graduation	May-2020	1	■

Appendix K

Theoretical Framework



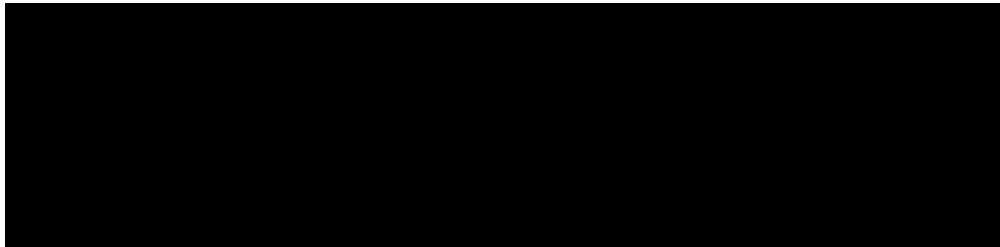
(Adapted from Graham, Logan & Harrison, 2006)

Appendix L**Budget**

Expenses	Costs	Total cost
Recruitment flyers	60 @ \$ 0.30	\$18
PHQ-9 Questionnaires	60 @ \$ 0.30	\$18
Sociodemographic surveys	60 x 2 pages @ \$ 0.30	\$32
Informed Consent forms	60 x 2 pages @ \$0.30	\$32
Cash Gifts	\$5 x 40 participants	\$200
Statistician Consult	\$100/hr x 3hrs	\$300
Transportation	\$ 100	\$100
Dissemination of posters	\$ 100	\$100
TOTAL BUDGET		\$700

Appendix M

Site Letter of Cooperation



Letter of Cooperation (Site Agreement)

Date: 5/21/19

Re: Letter of Cooperation for [REDACTED]

Dear Kenneth Ogali and Firmin Langyin,

This letter confirms that that I, as an authorized representative of [REDACTED] allow the Project managers access to conduct study related activities at the listed site, as discussed with the Project managers and briefly outlined below, and which may commence when the Principal Investigators provide evidence of IRB approval for the proposed project.

- **Research Site:** [REDACTED]
- **Study Purpose:** The primary purpose of the project is to identify depression in People Living with HIV/AIDS (PLWHA) using a validated depression screening tool known as Patient Health Questionnaire (PHQ-9). The project aims to establish the need for depression screening among PLWHA in a HIV care setting.
- **Study Activities:** The staff of the facility will be educated on the use of PHQ-9 for assessment of depression. The PHQ-9 screening tool (English version only) will be administered to patients who will voluntarily consent to participate in the project. In addition to screening tool, patients' sociodemographic data will be collected without patient specific identifiers such as names, social security numbers, and date of birth, place of birth, residential or mailing address, and phone numbers
- **Subject Enrollment:** People living with HIV/AIDS who are 18 years and above and who are willing to participate in the study with a written informed consent will be included in the project. Participants who indicate on the survey form that they are already diagnosed with depression will be excluded from the project study. The target sample size is 40.
- **Site(s) Support:** The site will provide the space to conduct the project activities and employees will also help to distribute flyers to clients.
- **Data Management:** Participants will not be required to provide identifiable information such as names and date of birth when completing the PHQ-9. In addition to screening tool, patients' sociodemographic data will not contain specific patient identifiers such as names, social security numbers, date of birth, place of birth, residential or mailing address, driver's license and phone numbers. Any information collected will be used strictly for the purpose of this project and


will be kept securely in a lock and key cabinet housed in the Rutgers School of Nursing which will only be accessible to the principal investigators of this project.

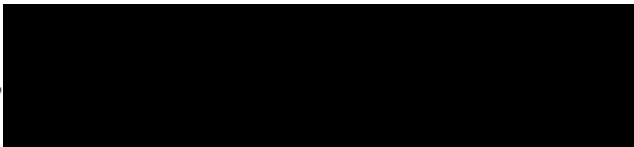
- **Anticipated End Date:** The project is expected to end in December 2019.

We understand that this site's participation will only take place during the study's active IRB approval period. All study related activities must cease if IRB approval expires or is suspended. I understand that any activities involving Personal Private Information or Protected Health Information may require compliance with HIPAA Laws and Rutgers Policy.

Our organization agrees to the terms and conditions stated above. If we have any concerns related to this project, we will contact the Principal Investigator. For concerns regarding IRB policy or human subject welfare, we may also contact the Rutgers IRB (see orra.rutgers.edu/h spp).

Regards,





Appendix N

Experience Time log

Date	Description of Experience activity	DNP Essential (Roman Numeral)	# Hours anticipated	# Hours completed	Cumulative Hours
1/14/19	First meeting with management of [REDACTED] [REDACTED]	I	5	4	4
1/16/19	Second meeting with management of [REDACTED] [REDACTED]	II	4	4	8
1/21/19	First meeting with management of [REDACTED] [REDACTED]	II	4	4	12
1/22/19	Second meeting with management of [REDACTED] [REDACTED] [REDACTED]	II	4	4	16
1/23/19	Attended DNP presentation	I	2	2	18
1/24/19	First meeting with Program coordinator of [REDACTED] [REDACTED]	II	4	4	22
1/25/19	Second meeting with Program coordinator of [REDACTED] [REDACTED]	II	4	4	26
1/26/19	Development of PICO question	I	4	4	30
1/28/19	Meeting with Chairperson	I	2	2	32
1/28/19	Attended DNP presentation	I	2	2	34

2/6/19	First meeting with the Director of care Cordination & Admissions in [REDACTED] [REDACTED]	II	4	4	38
2/6/19	Consult/refine PICO question	I	3	3	41
2/10/19	Second meeting with the Director of care Cordination & Admissions in [REDACTED] [REDACTED]	II	4	4	45
2/11/19	Meeting with the DNP Team member	I	1	1	46
2/11/19	Final presentation of PICO question	I	2	2	48
2/18/19	First meeting with the CEO in [REDACTED] [REDACTED]	I	4	4	52
2/20/19	Second meeting with the CEO in [REDACTED]	I	4	4	56
2/21/19	First meeting with Rutgers Librarian	I	4	4	60
2/22/19	Second meeting with Rutgers Librarian	I	4	4	64
2/21/19	Consult with HIV experts	VI	4	4	68
2/23/19	Refined literature search	I	6	6	74
3/18/19	Consult with the project chairperson	I	2	2	76
3/18/19	Appraisal of literature for inclusion	I	12	12	88
3/19/19	Appraisal of literature for inclusion	I	8	8	96
3/20/19	Review of evidence based material	I	16	16	112
3/21/19	Synthesis of literature	I	10	10	122
3/22/19	Synthesis of literature	I	10	10	132

3/23/19	Synthesis of literature	I	12	12	144
3/24/19	Synthesis of literature	I	6	6	150
3/25/19	Consult with the project chairperson	I	4	4	154
4/11/19	Consult with the project chairperson	I	4	4	158
4/8/19	Consult with the project chairperson	I	4	4	162
4/15/19	Consult with the project chairperson	I	4	4	166
4/17/19	Attend DNP presentation	I	2	2	168
5/6/19	Consult with the project chairperson	I	4	4	172
5/15/19	Consult with the project chairperson	I	3	3	175
5/18/19	IRB protocol development	I	12	12	187
5/19/19	IRB protocol development	I	12	12	199
5/21/19	IRB protocol development	I	10	10	209
6/3/19	IRB departmental review clarifications	I	6	6	215
6/4/19	IRB departmental review clarifications	I	6	6	221
6/6/19	IRB review clarification	I	8	8	229
6/26/19	IRB review clarification	I	10	10	239
6/27/19	IRB review clarification	I	5	5	244
7/30/19	IRB review clarification	I	4	4	248
7/31/19	IRB review clarification		6	6	254
8/28/19	Meeting with the Director of care Cordination & Admissions in [REDACTED] [REDACTED]	II	4	4	258

8/29/19	Meeting with the Director of Behavioral health services at [REDACTED] [REDACTED]	II	3	3	261
9/12/19	Distribution of recruitment flyers day 1	I	8	8	269
9/13/19	Distribution of recruitment flyers day 2	I	8	8	277
9/27/19	Administration of PHQ-9 questionnaire and demographic survey	I	8	8	285
9/28/19	Developing a manuscript	I	8	8	293
9/30/19	Administration of PHQ-9 questionnaire and sociodemographic survey	I	8	8	301
10/4/19	Administration of PHQ-9 questionnaire and sociodemographic survey	I	8	8	309
10/5/19	Conference submission	I	6	6	315
10/7/19	Consultation with Faculty	I	2	2	317
10/8/19	Administration of PHQ-9 questionnaire and sociodemographic survey	I	8	8	325
10/11/19	Meeting with the Director of Behavioral health services at [REDACTED] [REDACTED]	II	4	4	329
10/14/19	Data compilation	IV	10	10	339
10/15/19	Consultation with Faculty	I	2	2	341
10/16/19	Data entry into SPSS	IV	8	8	349
10/17/19	Data entry into SPSS	IV	8	8	357
11/2/19	Consultation with Faculty	I	2	2	359
11/22/19	DNP Project Poster Development	I	10	10	369
12/19/19	Data Analysis	III	16	16	385
12/20/19	Data Analysis	III	16	16	401

12/21/19	Data Analysis	III	16	16	417
12/22/19	Data Analysis	III	8	8	425
12/22/19	Consultation with Faculty	VIII	2	2	427
12/23/19	Meeting with the Director of Behavioral health services at [REDACTED] [REDACTED]	II	4	4	431
12/24/19	Discussion of Results	V	10	10	441
12/25/19	Discussion of Results	V	12	12	453
12/26/19	Final DNP Proposal write-up	II	20	20	473
12/27/19	Discussion of findings with program coordinator	VI	6	6	479
12/30/19	Development of DNP final Proposal Power point	III	12	12	491
12/31/19	Development of DNP final Proposal Power point	III	12	12	503