Using Quality Improvement To Implement Substance Use Disorders Services In Primary Health Care In Kenya: Impact And Experiences Of A Blended Course Among Health Workers Using The NextGenU Online Model

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Background: Worldwide, mental and substance use disorders (SUD) account for over 183.9 million disability adjusted life years. While interventions do exist they are not readily implemented, especially in low- and middle-income countries, due to a lack of available human resources, monetary resources, stigma, and difficulties in changing practice patterns. Quality Improvement (QI) has been reported in literature to successfully improve health services and systems through small-scale, iterative change cycles.

Objectives: This study assessed the impact of the NextGenU.org online blended course in terms of integrating, improving and sustaining mental health services using quality improvement methods in primary health care in Kenya. It also analyzed the experience of participants who completed the NextGenU.org online blended course.

Method: A mixed-methods study was conducted, incorporating both qualitative focus groups (FGD) and key informant interviews (KII), and quantitative statistical measures. Data came from the Computer-Based and Alcohol Training Assessment in Kenya (eDATA K), which was implemented in collaboration with the University of British Columbia (UBC) and African Mental Health Foundation (AMHF). FGDs and KIIs were analyzed using NVivo through a constant-comparison method, to identify themes emerging from the data. A second coder analyzed the data to ensure reliability and validity. Quantitative analysis was conducted to analyze the course completion rates. Additionally, the researcher incorporated their own notes from observations made during fieldwork over the course of a 12-week practicum with AMHF to triangulate the results.

Results: Overall, 27 screeners and clinicians completed the NextGenU.org online blended course. There were two FGDS and two KIIs conducted in Makueni county during July - September 2015. In terms of the staff's experience in completing the online course many participants noted strong facilitators such as: the certificates, desire for knowledge, personal motivations, relevant material, and case studies. The limited amount of space, computers, and restrictions on Internet access acted as barriers. Participants perceived their knowledge of QI methods, leadership, and time management to have increased from completing the course. Perceived self-efficacy also increased, as staff believed their ability to be a leader, manage time and deal with errors and mistakes within the workplace improved. There was also a positive shift in stigma associated with SUD. Most importantly, the integration and improvement in mental health services was maintained even though staff discussed common challenges, such as heavy workload and limited time. Some participants reported that some people in management roles should have been more supportive, as their limited involvement acts as a barrier to greater integration of services, while other where thankful of the management support.

Conclusion: This is one of the first studies of using QI methods to integrate, improve and sustain mental health services in the primary health care system in Kenya. Based upon the experiences described in the FGDs and KIIs, the blended online course was perceived to be acceptable, feasible and successful. The results indicate that quality improvement continues to be integrated in Makueni overall improving mental health services.

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SECTION I:

INTRODUCTION:

The World Health Organization (WHO) estimates that over 450 million people globally are experiencing or have experienced a mental illness (Marangu, Sands, Rolley, Ndetei, & Mansouri, 2014). Mental health includes a broad range of illnesses including: mood disorders, schizophrenia, anxiety disorders, personality disorders, eating disorders, gambling and substance dependency. One subcategory of mental illness is substance use disorders (SUD), which is defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM)-5 as "a cluster of cognitive, behavioral, and physiological symptoms indicating that the individual continues using the substance despite significant substance-related problems" (*Diagnostic and Statistical Manual of Mental Disorders*, 2013). Worldwide, mental and substance use disorders (SUD) account for over 183.9 million disability adjusted life years (DALYS) (Whiteford et al., 2013). While SUD can be clinically diagnosed, diagnosing a patient is not black and white, as substance use is often categorized on a spectrum and placing individuals into one category can be difficult, as not all substance use is problematic. Mental and SUD have a higher global burden of disease than HIV/AIDS, tuberculosis, diabetes, and transport injuries, but receive less attention and funding (Whiteford et al., 2013). Effective interventions do exist to address SUD, however they are seldom implemented, especially in low- and middle-income countries (LMICs) (Whiteford et al., 2013). Interventions are difficult to implement in LMICs due to a lack of human resources, lack of training for existing human resources, stigma related to substance use, and difficulties in changing practice patterns even when health workers are trained.

This introduction will first review the burden of disease from mental illness and SUD, and then describe existing effective interventions to address SUD, followed by the existing challenges to implementation and different proposed strategies to address SUD. This section will emphasize gaps in knowledge related to providing quality improvement (QI) to assist primary healthcare professionals in sustainably integrating mental health services. The introduction will conclude with a summary of the burden of disease and lack of effective interventions, highlighting the need to improve services, and the potential of QI to fulfill this gap.

This paper will then describe the methods and findings from 1) a literature review on QI in relation to mental health and substance use, and 2) a study of the experience of health care workers with-, and the impact of- a blended online QI course, followed by a discussion of the results in relation to the existing literature as well as the strengths and limitation of this study. Then a conclusion will highlight future implications for research and practice.

Burden of Disease from Mental Health and Substance Use Disorders:

"Mental, neurological, and substance use disorders are common in all regions of the world, affecting every community and age group across all income countries. While 14% of the global burden of disease is attributed to these disorders, most of the people affected - 75% in many low-income countries - do not have access to the treatment they need ("WHO| WHO Mental Health Gap Action Programme (mhGAP)," n.d.)." In 2010, mental illness and SUD were the fifth leading disorder using DALYS as the unit of measurement (Whiteford et al., 2013). Mental illness is defined by the DSM-5 as "clinically significant disturbance in cognition, emotion regulation, or behavior, that

indicate a dysfunction in mental functioning that are usually associated with significant distress or disability in work, relationships, or other areas of functioning" (Pomerantz, 2013). Using knowledge regarding the epidemiologic transition, mental health illnesses are expected to continue to increase in LMIC (Marangu et al., 2014). Although high and low-income countries have a similar patterns of mental illness, high-income countries have greater monetary funds and human resources to allocate time and money to develop projects, initiatives and policies to address the needs of this population (Marangu et al., 2014). In LMICs, lack of public attention, human and financial resources, and stigma have resulted in a large treatment gap ("WHO | WHO Mental Health Gap Action Programme (mhGAP)," n.d.). This is exemplified by the global median mental health workforce population ratio of 10.7 staff per 100,000 in comparison to Africa's median mental health workforce population ratio that is reported as 1.7 per 100,000 (Marangu et al., 2014). Many African countries spend on average 0.7% of the national health budget on mental health, as the national budget is about 10 USD per capita per year, that means that only 70 cents is spent per person per year on all mental health related services. (Othieno et al., 2013). As a subset of mental health spending, it means even less funds are allocated to programs or interventions focusing on SUD. Therefore, there is a lack of access to and coverage of services for SUD, which is troubling in the face of a large body of evidence supporting effective interventions that are recommended even in LMICs, as reviewed in the following section.

Effective Interventions for Mental Health and Substance Use Disorders:

In 2002, the Mental Health Global Action Program was launched to reduce disparities in mental health primary care in LMICs, and resulted in the creation of the

Mental Health Gap Action Plan (mhGAP) (Health & Action, n.d.; Marangu et al., 2014).

The mhGAP was developed to provide non-specialists with the tools to implement

evidence-based interventions focusing on: depression, psychosis, bipolar disorders,

epilepsy, developmental and behavioral disorders in children and adolescents, dementia,

alcohol use disorders, drug use disorders, self-harm/suicide, and other significant

emotional or medically unexplained complaints (Health & Action, n.d.). While the

mhGAP provides a template for the intervention, it does not describe how to do it, as it

allows for flexibility and adaptability in the local context and culture (Health & Action,

n.d.). The mhGAP's primary aim was to scale-up programs for mental, neurological and

substance use disorders ("WHO | WHO Mental Health Gap Action Programme

(mhGAP)," n.d.). The mhGAP-IG (intervention guide) was a strong starting point, but the

fact that it required adaptation at the local level is both an advantage and a challenge

(Patel et al., 2013). As the support to integrate the mHGAP-IG is limited to very few

settings, in most contexts the Ministries of Health (MOH) officials are asking health

workers to perform theses intervention without extra training, support, monitoring or

evaluation- resulting in negative unintended consequences (Patel et al., 2013).

The Programme for Improving Mental Health Care (PRIME) is another initiative

currently being implemented to improve mental health services within the primary

healthcare setting. PRIME's overarching goal is to generate evidence-based packages for

mental health care implementation and scale-up these packages within Ethiopia, India,

Nepal, South Africa and Uganda (Lund et al., 2012). This intervention includes a strong

emphasis on capacity building and knowledge translation of the results into policy and

practice in LMICs (Lund et al., 2012). The results have yet to be reported in the literature.

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) is a screening tool that was developed by the WHO in collaboration with international addiction researchers and clinicians to reduce SUD worldwide (WHO, 2010). The ASSIST includes 8 simple questions that were designed to be culturally neutral and useable across a variety of cultures, and only takes approximately 5-10 minutes to administer (WHO, 2010). While the ASSIST has strong reliability (Ali et al., 2002), the integration of these tools into primary health care facilities has not been effective, reducing the overall improvement in health outcomes.

Patel et al. (2013) stated that the most common reason for failure to integrate mental health services into primary care programs is a lack of adequate assessment, as well as overly ambitious target-setting without the necessary contextualization and full agreement on the targets and activities needed to achieve them. As such, barriers that exist to improving mental health services in LMIC will be reviewed.

Barriers to Improving Mental Health Services in LMIC:

Lack of Public Attention:

Even though mental health disorders represent some of the most common and disabling sources of human suffering, they do not receive adequate attention (Saraceno et al., 2007; Tsai & Tomlinson, 2015). One major reason why mental disorders are not receiving enough attention is because they were not directly titled as one of the Millennium Development Goals (MGD), and only indirectly included in the more recent Sustainable Development Goals (SDG). This is despite a burden of disease larger than many other conditions, and one that has continued to increase in the last 20 years, and is projected to vastly increase in the next decade (Lim et al., 2012).

Additionally, the use of a comprehensive public health framework for mental health is complex and difficult to explain clearly to policy-makers and stakeholders. Even the clinical classification of mental disorders is complex and includes a large area of very many different conditions, conditions that are frequently misunderstood. Therefore, advocates find it difficult to choose one specific disorder to focus on, which reduces the impetus for funders and policy makers to prioritize mental health disorders (Saraceno et al., 2007). These factors and others have led to a reduced priority, and limited the number of projects aimed at improving mental health services. This has had a domino effect for mental health indicators, as when there are few programs targeting mental disorders, research is not designing new indicators, further hampering improvement in surveillance and programs (Saraceno et al., 2007).

Lack of Competent Human Resources and Training:

Within all primary health care settings in LMIC there is an inadequate number of personnel (Saraceno et al., 2007). As such, the number of trained personnel specifically for screening and providing services and treatment for mental health is even lower (Lim et al., 2012; Patel et al., 2013; Saraceno et al., 2007). Additionally, evidence has shown that specialized psychiatric institutions are not as effective or efficient (Saraceno et al., 2007). These institutions are centralized in large urban areas, reducing accessibility for rural individuals. As well, these institutions often have higher cost compared to community care, isolate people from their support system and consume almost the entire national budget for mental health services (Saraceno et al., 2007). This has a negative impact on primary healthcare systems, as there are no extra financial funds to increase the number of human resources in primary healthcare. Moreover, even with increasing the

number of personnel in the primary care facilities, there is limited training or support, as mentioned above, which creates more difficulties to integrate changes to the health system when there is no plan for implementation of interventions, leadership or management.

Stigma:

Stigma is another barrier to improving mental health services, however, it is not a visible or tangible barrier, but its impact has large health and social consequences. Often health professionals, policy-makers and the general public view and understand SUD as a condition that has been self-inflected (Lindberg, Vergara, Wild-Wesley, & Gruman, 2006). This causes individuals to not report symptoms or acknowledge questions pertaining to their daily intake of substances for fear of being labeled. Additionally, individuals do not feel comfortable accessing services for SUD due to stigma. Stigma can also reduce the amount of funding donors distribute to certain projects, further hampering mental health programs. Patel et al. (2013) proposed integrating mental health services into primary care as a means to reduce stigma, as individuals will not be perceived as receiving services for any SUD.

From this global perspective it can be seen that mental disorders and specifically SUDs is having a devastating impact on individuals quality of life. Kenya in particular is one LMIC that faces these barriers to improving mental health services and has a high prevalence of SUD (NACADA, 2012). Kenya's burden of disease and country-specific barriers will be examined next.

Kenya's Burden of Disease from Mental and Substance Use Disorders:

Kenya is characterized as a diverse country, with approximately forty-two different ethnic groups (Kiima, Njenga, Okonji, & Kigamwa, 2004). As such, there are many different cultural beliefs and understandings surrounding mental health and the cause of illness. For example, some Kenyans believe mental health disorders are caused by super-natural powers (witchcraft), and those who do develop a mental illness do so in order to atone for sins committed by the clan against the ancestors (Kiima et al., 2004).

In 2012 the National Authority for the Campaign against Alcohol and Drug Abuse (NACADA) conducted a rapid situation assessment on the status of psychoactive substance abuse in Kenya. This assessment analyzed the nature, extent and patterns of drug abuse in Kenya, specifically examining effects to the individual, family and community at large (NACADA, 2012). Currently, in Kenya "twenty-two percent of all the sampled respondents (15-65 years old) were current users of at least one substance of abuse" (NACADA, 2012; p:3). The most commonly abused drugs are: alcohol, tobacco, bhang (marijuana), solvents/inhalants and miraa (khat) (NACADA, 2012). Among the individuals who were interviewed, the results indicated that if a drug was legal there was a positive acceptance of using the drug, as compared to illicit drugs (NACADA, 2012). While NACADA identified poverty, corruption, and break down of traditional values as key root causes of substance abuse, poor enforcement of the law and weak policies are also believed to be major contributing factors to high prevalence of drug and substance abuse (NACADA, 2012). Moreover, poor access to treatment and services in Kenya results in many individuals going undiagnosed and untreated, further exacerbating the

high prevalence of substance abuse in this country. Therefore, the next section will review the barriers and ways to improve mental health services in Kenya.

Barriers to Improving Mental Health Services in Kenya:

The Kenyan healthcare system is structured on six levels: national general and national specialist referral hospitals (level 6), county hospitals (level 5), district and sub-county general (level 4), health centers and maternity and nursing home (level 3) and dispensaries (level 2) and community (level 1) (Jenkins et al., 2010; Othieno et al., 2013). The WHO estimated that "the total expenditure on health as a percentage of gross domestic product is $32.0 (PPP int. $)" (WHO, 2006). In other words, Kenya's national government on average spends 10 USD per capita per year on health (Jenkins et al., 2010), while the non-governmental organizations and private health care organizations spend the rest of the total expenditure on health (Jenkins et al., 2010). Most of Kenya's health care funding comes from development assistance funds and donors, which is currently focused largely on infectious diseases. Therefore, most recently, Kenya has focused most of its investments on programs on communicable diseases such as: HIV/AIDS and malaria (Jenkins et al., 2010). This is largely due to the fact that these programs can be easily implemented, measured, and evaluated, allowing for these diseases to be key priorities for funders and donors. This is in contrast to what is observed with respect to mental health services. While integrating mental health services into primary health care has been a policy objective for the last three decades, no resource allocation or continuing professional development for staff has been implemented to date (Jenkins et al., 2010). As a result mental health services have not been integrated into level 1, 2 or 3 of the health system (levels that provide most of the primary care services).

Consequently, the Kenyan population has limited access to mental health services, especially in rural areas (Jenkins et al., 2010).

This is further compounded by the fact that there also exists a lack of doctors at the primary care level, as it has been estimated there are only 1-2 nurses or clinical officers for every 10 – 20, 000 persons (Jenkins et al., 2010). It is unknown whether primary health care doctors have received official in-service training on mental health disorders within the last five years (World Health Organization, 2011). The literature indicates that nurses have received in-service training and authorization to diagnose and treat/refer patients with mental health disorders, but nurse's express they do not feel adequately trained to diagnose patients (World Health Organization, 2011).

Over the last 12 years the Kenyan government has endeavored to collaborate with the WHO, Institute of Psychiatry and other key stakeholders to improve mental health services into their national health plan (Othieno et al., 2013). One outcome of this was in the Kenya Medical Training College (KMTC) continuing education course, which was launched in 2005 and funded by the Nuffield Foundation with the aim of integrating mental health services into primary care (Jenkins et al., 2010). The KMTC course has five modules delivered over 40 hours, in five days (Jenkins et al., 2010; Othieno et al., 2013). The modules include lessons on theory, discussion, role-play, and videos with a major emphasis on developing skills and competencies (Jenkins et al., 2010; Othieno et al., 2013). The training package was developed and adapted by the WHO collaborating center in dialogue with Kenyan partners and piloted to 20 senior KMTC ministry of health (MOH) staff, along with 41 selected trainers from KMTC in Nairobi (Jenkins et

al., 2010). One of the primary objectives of KMTC was to train 3000 primary health care staff using a sustainable general health systems approach (Jenkins et al., 2010).

The KMTC course was evaluated through iterative improvements on the course, feedback from teachers and students, written feedback from participants, pre- and post-evaluation of the first 1,000 individuals trained, supervision observation, and examination of routine data collection before and after training in two districts (Jenkins et al., 2010). Additionally, focus groups were held to understand health workers perspectives and experiences, as focus groups have been found to be an effective method to explore health worker and client views within the health contexts (Othieno et al., 2013). Unfortunately there is no data on the continuation of the health services learned by the workers in the different facilities, no plan to train more workers in other area. Moreover, forty hours (5 days) to cover all mental disorders, including substance use disorders, is still very little compared to the knowledge gap existing in primary care around effective interventions.

While the KMTC program intended to improve the quality of services, formal QI models and methods have not been frequently used in LMIC to integrate mental health services, but have had positive results in high-income countries. Research on QI is rapidly expanding, and many peer-reviewed reports have aided in mandating for policy changes that have improved and strengthened health systems. Previous reports on QI indicate that it is effective in LMIC for other health outcomes, and has resulted in sustained scale-up and adaptation of standardized treatment packages (Patel et al., 2013). As such, improving the integration of mental health programs into primary care could benefit from using a QI approach. Accordingly, QI methods will be examined next.

In summary, the burden of diseases from mental illness and substance use is large and growing, worldwide, with a large proportion of that burden of disease being bared by those in LMIC, where access to evidence based interventions is extremely low. Some evidence points to the use of QI methods as a promising strategy to help close that gap. However, there is no literature review on the subject of QI methods for mental health and substance use currently available in the scientific literature, and very few interventions examining the impact of QI training on mental health and substance use. Therefore this study has three objectives:

1. Summarize the literature from QI research related to mental health and substance use – covered in Section II, and

2. Examine the experience of health care workers in the completion of the NextGenU.org online blended course.

3. Assess the impact of the course in terms of integrating, improving and sustaining mental health services using QI methods in primary health care in Kenya.

SECTION II: LITTERATURE REVIEW ON QUALITY IMPROVEMENT RESEARCH RELATED TO MENTAL HEALTH AND SUBSTANCE USE

QI has been defined as a model to evaluate and improve systems through small-scale changes, utilizing available resources to improve health outcomes and processes (Chinman, Hunter, & Ebener, 2012; Patel et al., 2013). Moreover, QI aims to achieve a defined, time specific, actionable and measureable aim ("Institute for Healthcare Improvement: Science of Improvement: How to Improve," n.d.). Program evaluation assesses whether a project was successful in meeting its objective(s) by comparing pre-

and post- evaluation measurements. QI differs from traditional program evaluation as it involves an iterative cycle of identifying problems, developing change ideas, and monitoring performance. Based on the results of this process, changes are either implemented or new solutions created, while performance is continually monitored (Hunter, Ober, Paddock, Hunt, & Levan, 2014). This iterative process can use different models, but the most commonly used in health care comes from the Institute of Healthcare Improvement (IHI), which uses the plan-do-study-act (PDSA) model. QI is an efficient and powerful tool. While QI was originally created as a model to improve U.S manufacturing, it has recently shifted to improve the quality of healthcare systems (Hunter et al., 2014).

In 2001, the Institute of Medicine released the report entitled " Crossing the Quality Chasm: A New Health System for the 21st Century", which proposed using a QI framework to improve health and reduce the prevalence of psychoactive substance use (Pincus, Spaeth-Rublee, & Watkins, 2011). Despite this suggestion, the QI model has not yet been fully integrated into programs targeting psychoactive substance use thus far. Nevertheless, there has been an increase in the number of programs and interventions using a QI framework (Pincus et al., 2011).

Methods

A literature review was conducted using PubMed, Global Health, Medline as well as a grey literature search through Google scholar. The following terms were used: [quality improvement], [substance use], [mental health], [LMIC], [Kenya], [alcohol use]. All articles had to be between 2000 -2016 and in English. Some articles were retrieved from other articles reference list. In addition, consultation with experts in the field and

references from other documents contributed to finding more studies. At total of 56 studies focus on QI for mental health and/or substance use were found.

Results

The articles were screened based on the titles and abstracts, and then full text reviewed. Only 12 articles pertained to QI programs related to mental health and/or SUD. The literature review revealed there were only 5 studies from high-income countries; all were from the United States, and no such studies in LMIC. As such, this literature review scope was increased, to report of the use of QI methods related to any conditions in LMIC's. Therefore, this section will be divided into two sections. The first section will focus on studies conducted in the U.S that applied a QI framework to examine mental health and substance use services and policies. The second section will then focus on studies that report the use of QI in LMIC, even if they do not focus on reducing, preventing or treating the burden of disease from substance use.

Studies Conducted in the U.S:

Overall, five studies were identified that were conducted in the U.S that used a QI model to examine mental health and substance use. Of the five studies, there was a range of topics, including: process improvement QI, organizational change using QI, and the feasibility, preliminary efficacy, cost and sustainability of implementing QI.

Hoffman et al. (2012) initiated a program called The Network for the Improvement of Addiction Treatment (NIATx) at the University of Wisconsin that implemented five principles of QI, to improve processes in client access and retention in treatment for substance abuse (Hoffman et al., 2012). These principles are supported in literature and include to understand and involve the customer, fix key problems, pick a

powerful change leader, get ideas from the outside, and use rapid cycle testing (Hoffman et al., 2012). The results were that simple strategies were successful in improving the delivery of substance abuse treatment (Hoffman et al., 2012). For example, principle 1 – understand and involve the customer – NIATx included training administrative staff to answer client questions and billing staff to engage clients and perform individual financial consultations (Hoffman et al., 2012). Agencies that encountered staffing, accreditation or financial stress found it difficult to allocate staff time and energy to organizing and implementing PDSA cycles (Hoffman et al., 2012). Additionally, smaller organizations had more difficulty in implementing changes as they had fewer available resources (Hoffman et al., 2012).

Asarnow et al., 200AD) conducted an evaluation of QI to improve access to evidence-based treatment for depression in primary care settings. This study used a randomized control trial design that compared Youth Partners-in-Care (YPIC) that received a QI intervention compared to those that received usual care (Asarnow et al., 200AD). At baseline there was no significant difference between the two groups (Asarnow et al., 200AD). The results showed at the 6-month follow-up patients who received QI reported significantly fewer depressive symptoms, increased mental health in terms of quality of life and higher rates of satisfaction with mental health care than those receiving usual care (Asarnow et al., 200AD). The results from this study positively affirm that QI models can improve mental health services and improve health outcomes.

Two studies analyzed the feasibility, efficacy, cost and sustainability of adapting and implementing a QI intervention into community-based programs addressing SUD. Hunter et al. (2014) conducted a stepped-wedge approach, using case and control groups

within a non-profit substance-use disorder treatment center in Los Angeles County. This study reported that using a QI approach created an active learning environment, and when supported adequately, enhances collaboration and helps tailor interventions or programs to a particular context (Hunter et al., 2014). The authors acknowledged the limitations of this study with its small sample size, with limited generalizability.

Similarly, Chinman et al. (2012) adapted a QI program for community-based substance use prevention and treatment. This program used interviews with program participants to assess feasibility, acceptability, and resources required to adapt and implement such a program (Chinman et al., 2012). Similarly to Hunter et al. (2014), Chinman et al. (2012) found that when supported, QI is a feasible option. The results showed that over time the staff's enthusiasm decreased, noting the importance of support. Additionally, using a QI framework helped staff become more organized and accountable (Chinman et al., 2012). Chinman et al. and Hunter et al. show that QI allows staff to choose small-scale changes collaboratively, and see the change while also being involved in instigating change, further increasing self-efficacy, satisfaction, and overall sustainable change (Chinman et al., 2012; Hunter et al., 2014).

From the studies conducted in the U.S, it can be concluded that using a QI approach is both feasible and sustainable with adequate support and training, especially when appropriate consideration is given to local contextual factors and resource constraints.

Studies Conducted in LMIC:

In total, five studies and two reviews were identified related to QI in LMIC. While none of these studies focused explicitly on mental and substance use, highlighting

a major gap in the literature, the results from these studies will help to indicate whether QI has been found to be a suitable method to improve health systems in LMIC.

'Project Fives Alive!' was initiated in collaboration with the IHI and the National Catholic Health Service (NCHS) in 2008 that aimed to reduce the under-five mortality rate in Ghana using QI. During this project, partners worked with primary health care workers to develop, test and implement successful change ideas using PDSA cycles to test different small-scale ideas to overcome system barriers that contribute to children mortality (Report, 2012). 'Project Fives Alive!' began in three districts in Northern Ghana and over five years has scaled up to thirty-eight districts and thirty-two hospitals, signifying the success of the program (Report, 2012). This project continues to receive funding, and had created two change packages, along with a new project aimed at improving access to maternal and newborn health services among women in Ghana (Report, 2012). 'Project Fives Alive!' uses the IHI break through series model to educate health care workers, as well as create teams to conduct their own learning sessions every 4-6 months (Report, 2012). Overall, this project shows that locally driven and monitored serial small-scale changes attempts can lead to large improvements in health outcomes in LMIC.

A separate study conducted in Ghana examined whether QI methods previously existed for surgical care (Choo et al., 2013). This study used a mixed-methods approach, analyzing staff perceptions and identifying barriers. The results indicated that nine out of ten hospitals in chosen areas already had QI activities being conducted. It is possible the success of 'Project Fives Alive!' in many Ghana hospitals and districts may have initiated further QI programs in the hospitals analyzed in Choo et al.'s study. Both studies in

Ghana show that QI methods can be successful and that staff were willingly to integrate QI methods into their daily practice.

In Tanzania, Memiah et al. (2015) used QI methods to examine the barriers of small-scale change to improve patient ownership and participation in their own healthcare. This was undertaken through educating and training staff on QI and emphasizing the national HIV treatment guidelines for CD4 cell counts, including laboratory testing and staging of disease that improve clinical system and care (Memiah et al., 2014). The team identified lack of knowledge about CD4 cell counts and lack of testing by clinicians as a barrier to timely initiation of treatment (Memiah et al., 2014). Through identifying the barriers using QI methods - such as continuous change and scale-up of successful ideas - the project was successful in stimulating earlier treatment, increased uptake of CD4 testing, treatment initiation and improvement on patient retention (Memiah et al., 2014).

In Karachi, Pakistan, Hashmi et al. (2013) studied the clinical efficacy and long-term durability of a trauma quality improvement (TQI) program. TQI empowered local team to make small-scale changes, instead of attempting to resolve larger structural issues that staff could not change. This program was successful in reducing adverse outcomes due to trauma, but not without the support from the hospital management (Hashmi et al., 2013). Moreover, this study evaluated the long-term durability five years after the program had stopped, and saw that QI methods continued to be used. This highlights the long-term sustainability of QI.

Another study was conducted at Techran University of Medical Sciences and Health Services that was aimed at shifting behavior using the Quality Improvement

Training Cycle (Mohammadi, Mohammadi, Hedges, Zohrabi, & Ameli, 2007). This QI model was multi-stage, and included training workshops, consultations, facilitations, demonstration, recognition, and evaluation (Mohammadi et al., 2007). Similar to 'Project Fives Alive!' this project used PDSA cycles. Additionally - similar to all the projects conducted in LMIC - this project had support from management, which was integral to the success of the program (Mohammadi et al., 2007; Report, 2012). While this training was only over nine months, it was determined that behavior change was successful, but possibly not sustainable; as behavior change is difficult to sustain and the evaluation was not long-term (Mohammadi et al., 2007).

Leatherman et al. (2010), produced a report highlighting the proposed results from a group meeting on QI, which included discussion on a shared definition of QI, what areas QI focused mostly on in LMIC to date, whether programs had been successful and sustainable, and what factors contributed to a successful QI project implementation. Overall, the results showed that QI was defined as both a philosophy and a family of discrete technical and managerial methods (Leatherman, Ferris, Berwick, Omaswa, & Cris, 2010). Furthermore, the report emphasized that most QI projects focus on acute illness, improvement in prevention, and chronic conditions (Leatherman et al., 2010). While there was only a small amount of literature on QI in LMIC, research on this area of study is expanding. Additionally, most successful QI projects are multimodal, incorporating continuous measurement, feedback on progress, and subsequent attempts at improvements through different modalities (Leatherman et al., 2010). Five action items were created to move forward and incorporate QI into the WHO Health System

Framework. This report highlights the need for further research on QI in LMIC, especially focusing on mental health and substance use.

Franco & Marquez (2011) analyzed 54 projects that USAID financially supported on improvement collaboration in 14 LMIC. All of these projects used the IHI Break Through Series (BTS) model for improvement, similar to 'Project Fives Alive!' (Franco & Marquez, 2011). The results indicated that all the projects were successful in generating significant improvement in performance and improvement in quality of care (Franco & Marquez, 2011). Furthermore, the results were maintained, and in some cases remained up to four years following project implementation. Franco & Marquez (2011) noted that since LMIC have many areas for improvement, QI interventions could be more effective in LMIC as compared to high-income countries.

CONCLUSION

From the literature review examining QI programs in both the U.S and in LMIC, it is evident that research on QI and mental and substance use is scant worldwide, and inexistent in LMIC thus far. Projects that have used QI methods in LMIC have shown that programs can be successful in improving health outcomes and processes, when adequately supported, these programs are sustainable. Furthermore, the literature highlights that LMIC may actually have more to gain as compared to a developed country when using QI, as there are many areas for possible programs to focus on. Additionally, many health problems in LMIC are due to larger structural barriers and QI provides an avenue for sustainable change. Small-scale changes that the staff can make can provide large health improvements that staff may have not thought possible previously.

Therefore, programs need to be conducted on mental health and substance use using QI in a LMIC. As Kenya is currently experiencing a vast shortage of health care workers who are trained to screen and treat individuals who face SUD, this is a setting that would benefit from further research on this topic. While most studies that have utilized QI have evaluated the efficacy and effectiveness of the QI program, few have evaluated the experience and impact of staff involved in the QI program. Therefore, this current study will aim to fill these gaps in the literature.

SECTION III: STUDY OF THE EXPERIENCE WITH AND IMPACT OF eDATA K BLENDED ONLINE QUALITY IMPROVEMENT COURSE

METHODS:

Blended Online Learning Model

The practice-support component of eDATA K consisted of a blended online course, including three sections: NextGenU.org, IHI, and Learning Sessions (LS). NextGenU.org has partnered with many leading universities, societies and government organizations to provide an accredited online university platform to give individuals the opportunity to learn for free and gain credit for their training ("NextGenU.org The world's first portal to free, accredited, health education: Login to the site," n.d.). Each module includes different competencies that were created through a global peer community of practice and local skills oriented mentorships ("NextGenU.org The world's first portal to free, accredited, health education: Login to the site," n.d.). The specific competencies related to practice-support were created from the Canadian College of Health Leaders and NHS Leadership Academic ("NextGenU.org The world's first portal to free, accredited, health education: Login to the site," n.d.). In total, the

NextGenU.org included four modules, which included IHI as an integrated module within this section. The IHI consisted of seven modules focusing mainly on QI. Both NextGenU.org and IHI required participants to take a quiz at the end of each module, where they had to receive an 85% or higher to continue onto the next module. The LS were conducted in-person by AMHF staff in the primary health care facilities. In total, there were four LS.

Qualitative Methods

This study used a mixed-methods design to gain an in-depth understanding of the health care workers experience in completing the blended online course, their patterns of use of the QI methods, and the impact on mental health services. Data came from African Mental Health Foundation (AMHF), who provided written permission for a secondary analysis, focusing on Makeuni County. Qualitative methods were well suited to this study's objectives as this was a new area of research, where there were not standardized or validated survey instruments, and where the experience was highly variable from one setting to another and from one participants to another (Snape & Spencer, 2003). In addition, qualitative methods help to generate a comprehensive understanding of the phenomenon in its social, psychological, economic, political and material context; especially when qualitative data comes from a variety of sources triangulated to extract nuanced meaning of participant's experiences (Onwuegbuzie, Dickinson, Leech, & Zoran, 2009; Snape & Spencer, 2003). Focus group discussions enable the capture of various perspectives and how the various participants react to each other's statements (Onwuegbuzie et al., 2009). This was an appropriate method design to stimulate deeper understanding by stimulating exchanges between the participants, and exploring the

various participants' common and divergent perspectives (Onwuegbuzie et al., 2009; Snape & Spencer, 2003). It was important that the focus group were conducted by competent researchers, as well as ensuring a safe, stimulating, and engaging environment for discussion, with judicious use of probing questions, rephrasing and summarizing to verify understanding and promote interactions between the participants (Onwuegbuzie et al., 2009).

AMHF conducted the focus group discussions (FGD) and key informant interviews (KII) with eDATA K screeners (i.e.: community health workers, or support staff in the hospital outpatient clinics), clinicians (i.e.: nurses and clinical officers) and health officials, from July – September 2015 in Makueni district. The FGD and KII questions were created in collaboration with the researchers (practicum student and the eDATA K co-PI) and AMHF eDATA K team. The questions were created using preliminary results from the pilot course, but were adapted for this specific online course, as well the questions integrated comments participants had mentioned throughout the course. The questions were translated back and forth between English and Kiswahili to ensure the language was culturally appropriate for each group of participants.

The eDATA K team used a purposive sampling framework to recruit participants to capture the diversity of experiences. The criteria that was used to choose participants for the focus groups and interviews included: different professional backgrounds and cadres (i.e.: clinicians, health officials, screeners), a mixture of female and male, people from each facility that participated in the practice improvement course (NextGenU.org), including some who finished and some who did not finish the course, and all participants were required to have participated in implementing and sustaining the practice changes.

The research team chose to include people who had started the course, but may have not finished the course to better understand why certain individuals chose not to complete the course. Additionally, the team tried to include people who had had a positive and negative experience with implementing and continuing the practice improvement. Finally, staff availability on the day of the FGD was considered (based on work schedule). The eDATA K team randomly selected participants who fit the criteria and recruited them by telephone. All staff that participated in the FGD or KII were provided with 500ksh (approximately 5USD) for transportation reimbursement.

In total two FGD were conducted, one with screeners and one with clinicians and health officials. The focus groups were held in Makindu hospital, which was a central location. The KII were conducted at their respective facility. All participants provided written informed consent, where they were informed about the purpose of the study, the recording and data stewardship, as well as any risks and benefits. All focus groups and interviews were audio-recorded and conducted in Kiswahili, with some English. Following the focus groups and interviews a separate AMHF staff translated and transcribed the interviews and focus groups. When the researcher for this present study received the transcripts, the data had been de-identified ensuring the confidentiality of all staff who participated in the focus groups and interviews.

The focus groups and interviews were analyzed using NVivo software version 10.0. A constant-comparison method was used, where themes emerged from the data, but were also derived from a prior literature review. Analysis began with the researcher becoming immersed in the data to develop a strong understanding of the material. From this point, seven broad themes were developed. Following this the researcher reviewed

the data several times. As further sub-themes emerged, further larger themes were developed, the data was re-organized and re-coded. This process continued until saturation was reached. When no more sub-themes emerged, the data was re-analyzed one more time, to ensure that all sub-themes and larger themes were populated with all relevant transcripts extract, and to ensure no further insight arising from the data was gained. The final themes and codes were compared to AMHF's qualitative researcher's themes to increase validity and reliability of results. Additionally, the researcher incorporated their own observations from their fieldwork during their 12-week practicum with AMHF from field notes about their experiences. This inclusion was used to triangulate the results, through the use of memos and annotations of the meaning of the themes and sub-themes.

RESULTS

In total, 40 health workers registered for the QI course and logged-in at least once. Of that, 27 completed all three sections (67.5%). A total of six community health workers and support staff participated in the FGD with screeners (four females and two males), and four people participated in the FGD with clinicians and health officials (two males and two females). The screener's FGD had approximately equal representation from all facilities that participated in the online course. The FGD with clinicians had a slightly higher representation from one of the larger facilities. Additionally, two KII were conducted with head nurses, one was with a female and the other a male, each from different facilities. A total of 12 participants (30% of those who logged-in) participated in the FGD or KII. Field observation was conducted every other week during the student's 12-week practicum in Makeuni County.

This section describes the major themes that emerged from the data starting with 1) the experience of participants who completed the course, followed by 2) their experience with sustaining and adapting the screening and interventions based on what they learned in the course.

1) Experience with the Blended Course:

This section will cover a) the motivating and facilitating forces experienced by the participants while taking the course, b) the structural and environmental barriers some of them experienced, as well as c) the feedback from the participants on the various course components adequacy and usefulness.

1.a Motivating and facilitating forces:

Motivations for completing the blended online course were an important theme that emerged from the data. Screeners and clinicians both identified the desire for knowledge and skills as a strong motivator, emphasizing the examples in the course that stimulated the learners to explore the entire course content. This encouraged learners to change how they previously managed real life issues in practice. Moreover, the learners' confidence increased in regard to initiating change, and improving their leadership and conflict-resolution skills within the health care setting. As one clinician stated:

The practice support is very interesting, it has very nice examples and the language it is put in is quite encouraging, and it therefore builds you up to be able to face people with drug and substance abuse in a better way with very smart examples. [Makueni Clinician]

And one screener said:

The ones [examples] they were giving like this surgeon who did the surgery on the wrong knee. He did on the right one instead of the left knee and that was a blunder that was an error, which really affected the patient. So you feel you want to know more because these are actual life experiences. [Makueni Screener]

The interactive feature of the online course was another facilitator, specifically the videos which visually explained material was attractive to staff, as they found it piqued their interest to continue reading and moving through each module. The encouraging and simple language used in the online course was important to clinicians as it created an environment that was conducive to English as a second language and motivated them to continue the course. However, it is important to note that screeners sometimes felt the terminology used was too advanced for them. When the course was created it was not intended for screeners to compete the course. However, as the implementation occurred screeners were offered the opportunity to also participate.

Personal motivations to improve the healthcare system to address SUD were also important; as many staff knew of someone (either a family member or friend in the community) who struggled with an alcohol or drug use. More screeners discussed personal motivations as compared to clinicians.

Furthermore, the certificates provided by IHI and the NextGenU.org graduation ceremony were tangible factors that motivated staff to complete the course, as well these certificates helped to improve their curriculum vita (CV) and education. In addition, AMHF staff assistance and support was also a motivating forces.

1.b Structural – Environmental Barriers:

As participants discussed challenges in completing the blended online course, they mentioned influences that they could not change themselves, which were labeled as "Structural - Environmental". These included available resources and network issues. Available resources consisted of: space, availability of computers in the facilities, and the

amount of Internet access 'bundles'. The Internet bundles were scratch cards that provided a certain amount of data capacity from the Internet in the form of megabytes, etc. When discussing the number of computers, participants from one of the four facilities voiced that there were not enough computers in their facility so occasionally two individuals wanted to spend time on the computer to complete different modules at the same time in which case one individual had to wait until the computer was free (and they were free from work).

The network issue was a large barrier for staff from one facility since the construction of the railway in Kenya had accidently destroyed "the booster" for the Internet in that area. Therefore, the Internet modems would take an extremely long time to load each page taking up a lot of the Internet bundles, more than what the project team had allocated in their budget. During this time participants were going through the IHI portion of the NextGenU.org modules and found it difficult to complete the modules on time. As one Clinician said:

That would be the IHI. For the first time we experienced a lot of network problems and we realized it was not our own making here but when the standard gauge railway was to pass through Makindu and this interfered with the booster that was giving us good network. We were not able to access the modules and be able to go through them quite easily like we did with other online learning. [Makueni Clinician]

However, it is important to highlight that during the course participants identified this as a problem and called the AMHF project team leader to ask for extra Internet bundles, which were provided, and participants were given extra time to finish the course, and some even altered their schedule to be available at a time when the network was better, and were eventually able to complete the course.

[AMHF] also provided us with airtime and those of us with laptops would wake up early at about 4am and continue since the IHI network was not a problem during those odd hours. [Makueni Clinician]

1.c Feedback on the various course components:

The blended online course included NextGenU.org, IHI, and LS. The feedback on each of these components is summarized below.

NextGenU.org

Overall, the clinicians strongly enjoyed the NextGenU.org online course. Although some material was specific to Africa, most of it was from Western countries, and some expressed that the content did not always directly apply to them. One individual also voiced that the NextGenU.org was too theoretical, that more illustrations to represent concepts would have made the online course more engaging.

IHI:

Many clinicians voiced that the practice improvement (QI) modules provided by IHI were "helpful" and "good", and that IHI complemented the NextGenU.org modules well. Additionally, it was voiced how each module was relevant, and built upon each other, which was seen as a positive factor. As one participant said:

I would highly recommend the practice support …[it] was quite good and I liked it. [Makueni Clinician]

Clinicians reported they were frustrated by the fact that if you did not receive a high enough grade on the IHI quiz you were required to go back and repeat each step of the module again before retaking the quiz. Certain clinicians felt this was frustrating since they also struggled with the network issues and the pages took a very long time to load,

making it very difficult and long to complete a module if they did not receive a high

enough grade.

Despite some clinicians and screeners appreciating the videos and examples, as

mentioned in the motivations section, others expressed disappointment that the videos

and examples focused on North America and Western countries. They felt these

examples did not always apply to them and therefore were not always useful. They would

have appreciated the videos and examples including Africans. As one participant said:

And also when they are giving those examples because maybe you could find like videos being played there, giving examples, let them choose also Africans, blacks. Not only whites. [Makueni Clinician]

Learning Sessions:

Universally all staff thoroughly appreciated and enjoyed the LS. Generally

speaking the LS helped to answer any queries that individuals may have had during the

completion of a specific module online. As one screener said:

And it helped us even to understand more the ones that we had learnt, and we didn't understand like the fish born (an exercise from IHI to get to the root causes of a problem), the equation, the Y, you know they were getting interpreted more in those mentorship levels. We could learn something from the Internet but we didn't understand, there was more elaboration when it came to the mentorship. [Makueni Screener]

The LS helped to broaden understanding, as the online portion was excellent in

providing a foundation of knowledge, and provided an opportunity for staff to practice

skills and receive feedback. In addition, the LS boosted staff morale in both what they

were accomplishing, as well as motivating them to continue completing the

NextGenU.org blended course as they were provided with the opportunity to discuss

amongst themselves different strategies they used to complete a module. This helped

certain individuals increase their confidence and motivation to continue completing the

course. Staff mentioned that often more people wanted to participate in the LS, but due to limited capacity and budget the facilities were required to maintain a minimal number of staff so not all staff could participate.

2) Impact of the Blended Online Course:

2.a Use of Quality Improvement Techniques:

Participants were asked how often they used the techniques taught in the course (i.e.: how often they recorded the number of screenings and brief intervention, and how often they graphed their data). In general they expressed that they used them, but not necessarily exactly how they were suggested. For example, clinicians and screeners were asked about whether they charted their data and created graphs, and whether they found using the charts helpful. While few facilities graphed their data each week, most of them admitted they recorded the numbers daily and would chart the data month by month. One clinician expressed that the graphs helped to "easily see the trends, [as]… it was easy to see and be able to interpret it [the graph], when you went up and where you went wrong, and see the pattern".

When the staff were asked to recall their most memorable or effective change idea and why that might have been, many clinicians remembered simplifying the process or "checklist". This corresponds to direct observations conducted during one of the LS, where many of the clinicians discussed how they had initiated a change idea related to screening mothers as they were coming in for their prenatal appointments. They described that they would simply ask whether the mother drank alcohol during an informal conversation. The clinicians found that this one simple question was helpful in determining if there was a need for a more structured screening and brief intervention.

Other change ideas mentioned were related to expanding the scope of who to screen and where the screening would take place. For example, during a FGD, a clinician stated their most powerful change idea was screening across all departments of the hospital, and not just in the outpatient clinic.

Overall, the participants' accounts indicated that they learned the skills to apply the knowledge, use the change ideas efficiently and transfer the knowledge into other contexts. As such, this will be further explored in the next sub-section.

2.b Applicability/Transferability:

One theme that emerged from the FGD and KII data that did not directly correspond to any specific questions was related to *applicability and transferability*. Questions that pertained to integrating brief intervention and screening into daily routine, elicited discussions regarding how participants had applied knowledge from the blended online course in their community, with family members, or in other areas at work. As one participant said:

I have a [inaudible] who uses drugs and my interest is like when we are learning about substance abuse, I was interested to apply the knowledge I have acquired in practice support and substance abuse and then I put it into practice to help the family members and the entire community to change their life style. [Makueni Screener]

Another participant mentioned a similar dynamic:

The change idea is very easy to adapt in the communities and those that are hard to adapt to, we can go back and change them. [Makueni Clinician]

Additionally, participants discussed exchanging information and change ideas between facilities. This emphasized an important mode of communication within the Kenyan context and how knowledge is transferred between dispensaries/hospital. As two participants explained:

... in Kiboko some community health workers like me am [are] not working anywhere else, and we exchange ideas as the community health workers [...]within the community, in the church ... merry go round. [Makueni Screener]

It also gave me some drive in terms of being careful as we handle people, I shared with my nurses some of this examples. [Makueni Clinician]

This reflection indicates that participants were able to apply and/or transfer the knowledge into other areas of work and within their community. This suggests the course was successful

2.c Empowerment and Sustainability:

Empowerment was another theme that emerged from the FGD data that did not pertain to any specific questions asked during the FGD or KII. The perception that the online course resulted in increased empowerment was a facilitator related to sustainability. Increased empowerment (self-efficacy) was possibly an end result of the modules that focused on leadership, managing error and mistakes, and time management (NextGenU.org). Clinicians spoke about the fact that now they can "work on time and in how I attend patients", and how the modules "build you up to be able to face people with drug and substance abuse in a better way with very smart examples". These reflections highlight that completing the blended online course led clinicians to feel confident in their knowledge and skills, and be better equipped to help their patients with SUD, in addition to being on time and organized while at work.

When the clinicians and screeners were asked directly about sustainability - specifically whether they continued to screen and conduct brief interventions, the majority of staff responded in agreement and provided anecdotes that suggested using QI to integrate mental health services was sustainable. Most participants described

continuing to screen individuals and provide brief intervention "as a part of their daily routine", and if they didn't engage in those activities "they felt they were missing something".

As one person said: *We have become addicted [to screening and BIs] (all laugh).*
[Makueni Screener

2.d. i Structural – Environment barriers:

When discussing what barriers or challenges were faced during the integration, adaptation and sustainability of QI into their daily routine, participants identified two major *structural* barriers: *Environmental* and *Resource Management*. These barriers represent structural constraints as the participants could not change these factors themselves, but instead had to develop strategies and make changes in their routine or adapt the tools. Time and workload were two major *environmental* factors that impeded the impact of QI. However, clinicians and screeners developed change ideas that simplified the screening tools to make it easier and quicker to screen patients. As one clinician reported:

Apart from the tools, I think it would be okay as long as you work on shortening the time for the tool. Sometimes due to workload, we have a challenge as we may receive a lot of people. [Makueni Clinician]

Additionally, workload for the clinicians was a large barrier as they found it difficult to spend a lot of time with one when patient conducting brief interventions, which would cause the line of patients waiting to continue to grow, ultimately causing the clinician's day to be very busy and long.

Analysis also revealed that financial constraints were perceived as a barrier for screeners, but not clinicians. This could because screeners do not have full-time

employment and depend on occasional stipends from the government for participation in community health worker tasks, and did not receive any further financial compensation to take on the screening role for SUD. Whereas clinicians have full-time work, and included the brief intervention as part of their regular clinical work. As such, screeners had discussed an increase in financial incentives to reduce economic barriers, to pay for their transportation to and from the health clinics when they visited the health clinic to screen patients. As one Makueni Screener said:

I also think there should be maybe some financial support like these guys she has to use money from her own pocket for transport and everything. [Makueni Screener]

2.e. ii Structural – Resource Management:

The second *Structural* barrier was *Resource Management.* This theme included any mention of management or individuals ranked above the clinicians or CHWs who acted as a barrier in the integration and sustainability of QI.

Resource Management was perceived by some participants in some settings as a barrier due to the fact that those in management roles gave "empty promises" and had not "fully accepted" using QI in the healthcare setting to improve mental health services. One clinician summarized it succinctly:

The big challenge I would say is, ok it is not that big but I would say that the administration has not fully absorbed the study. You find that partially part of the administrator so you find that the HIO office (Health Information Officer), the MED sup office (Office of the Medical Superintendent) if you ask them if they know about this they may actually have an itch they are not really sure what goes on but the side of the matron office it has majorly embraced the thing. [Makueni Clinician]

However, only a few clinicians discussed management as acting as a barrier, suggesting that select dispensaries or hospitals had more support as compared to others.

Furthermore, from my direct observations during the final site visit, only one hospital experienced little to no support from management, but interestingly this hospital had some of the most successful integration of QI into their daily routine based on the data.

2.f Impact of the course on awareness of substance use patterns, cultural implications, and gender issues:

Screeners reported that the course increased their awareness of problems related to substance use in their community, in terms of age of exposure to psychoactive substances, risk factors related to consuming substances, and how culture and stigma might interact with the delivery of the SUD screening and intervention.

This insight emerged through their experiences implementing, adapting and sustaining the delivery of the screening and brief intervention. They reported mostly that they became aware of the young age at which individuals started using, or had the opportunity to access legal and illegal psychoactive substances. Many screeners voiced that individuals below that age of 18 were drinking illicit brew in Makueni. They had not realized that before because initially, for ethical and logistical reasons during the screening to recruit for the randomized control trials (RCT) phase of eDATA K, those less than 18 years old were excluded. Once the facilities implemented change ideas to adapt what they were doing, in order to better fit with their facilities and reach their target number of people screened, they began screening those under the age of 18. They considered that an especially good idea since that age category had been largely missed by the screening effort for RCT enrollment.

Additionally, through the course screeners realized many individuals in Makueni were not aware of the risks related to their previous substance use "or "taking of illegal substances (i.e.:khat)", as often it has been a part of their childhood.

A story was retold about "the mama who makes illicit brew": "[her] girls are the ones to collect firewood [used in the process of making the brew], they even sell the illicit brew…so at the end of the day you find these children are taking the same." This story highlights how families as a whole participate in making illicit brew and then consume it together, introducing the children to alcohol and creating a social norm that it is socially acceptable to consume large quantities of alcohol. The participants expressed this was a relatively common occurrence, and as such, many screeners identified that parents who make illicit brew or distributed illegal substances with children witnessing it, led to an increased likelihood that the children would subsequently consume substances. They explained that the children exposed to the making or selling of these substances seem to find nothing wrong with themselves participating in the process of making and consuming the substances.

During the FGD and KII there were specific questions related to gender, such as whether screeners or clinicians noticed if certain patients seemed uncomfortable to speak about substance use with someone of a different gender, and if some asked to speak to a screener or clinician of the same-gender. The staff reported that they did not receive requests from patients to talk to or receive the intervention from someone of the same gender, and that they did not see the need to adapt the intervention in relation to gender issues. However, participants reported that different tribes have unique cultural norms, and that specifically the Maasai tribe culture does not allow women to speak to men

about substance use. However, the area in which the study was conducted was far from traditional Maasai territory and the local tribes did not seem to have such issues. On the other hand, all screeners and clinicians voiced that in general females were less likely to admit to "taking alcohol" as it was a Kenyan cultural norm that women should not drink, and overall was less accepted within the community.

2.g Impact of the course on stigma:

Additionally, a shift in stigma within the primary health care staff surrounding their acceptance and understanding of psychoactive substance use disorders emerged from the data. This shift in stigma specifically from the QI course (as opposed to the prior clinical courses the participants had taken) was not a theme that the research team had expected to emerge. Following the completion of the blended online course, many screeners and clinicians voiced that "before" they used to "fear a drunkard" and sometimes ignore that clients smelled of liquor and were visibly intoxicated and left them undiagnosed and untreated due to lack of confidence in how to deal with these issues as well as a lack of processes to deal with people who presented with SUD.

DISCUSSION:

Overall the course was perceived to be successful as the participants were able to integrate and sustain the inclusion of new mental health services, in relation to substance abuse, and associated complications and co-morbidities, in Makueni, Kenya. The results described eight major themes that emerged from the participant's experience completing the course and integrating and sustaining mental health services using QI. In relation to the online course, personal motivations and structural facilitators were important, while there were several environmental barriers in relation to workload and access to

technology that complicated the completion of the course. Overall, the feedback highlighted several strengths of the course, including its concrete examples (although mostly from western countries) and in-person LS. In relation to the QI techniques, major themes revealed good applicability and transferability, increased empowerment among health workers to make change and sustain the interventions, and addressed some structural-environmental and resource management issues, while others remained. The course and the implementation of the QI method also had an impact on health workers awareness of substance use patterns, cultural implications, gender and stigma. The recommendations participants emphasized most for future blended online courses were to incorporate local relevant examples that are culturally appropriate and relevant. As well, changes to the design/layout were strongly recommended to speed up the length of time to complete each module.

To the best of our knowledge, this is the first mixed-methods evaluation examining the experience and impact of using a blended online course to training primary health workers on using QI to integrate, improve and sustain mental health services and reduce substance use in rural LMICs. These forces affecting the completion of the course and successful implementation of QI techniques are discussed in-depth in this section, followed by a discussion of the major strengths and limitations of this study.

1.a Motivating Factors:

There were six major motivating facilitators participants identified from completing the course. These were: desire for knowledge, interactive features, personal motivations, the certificates and graduation ceremony, simple and encouraging language. These findings are consistent with previous literature examining motivations for

completing online courses. Mckimm, Jollie, & Cantillon (2003) found the interactive

feature of online learning is essential as this create an environment that is participatory

and more meaningful to learners. Rigby et al. (2012) found that online learning created a

more flexible environment for students and learning, which increased participant's access

to different evidence-based databases. These results correspond to the motivation of

desire for knowledge. Song, Singleton, Hill, & Koh (2004) also identified the design of

the online courses as a major motivating factor to complete an online course.

Specifically, examining what online model best presents processes that are similar to

face-to-face interactions and finding what works best for the target population (Song et

al., 2004). This finding corresponds to the simple and encouraging language participants

identified. Hew & Cheung (2014) studied motivations of learners to enroll in massive

open online courses (MOOCs) and found the highest reported reason was the desire to

learn about a certain topic and to increase their knowledge. While the second motivating

factor was the certificates MOOCs provided (Hew & Cheung, 2014). These results

correspond to our findings of personal motivations and desire for knowledge as major

motivations for completing the blended online course.

1.b Structural – Environmental Barriers:

The major challenges that were articulated from the FGDs were structural barriers

that participants could not change; those included: available resources and poor

network/Internet reception. Available resources consisted of: available space, number of

computers, and Internet bundles. Although network issues seemed to only strongly affect

one facility, it is important to examine whether other studies conducted in LMICs

experienced similar issues. Tarus, Gichova and Muumbo specifically analyzed challenges

that Kenyan public universities faced while implementing an eLearning course. They similarly identified infrastructure, similar to structural barriers, as a major challenge (Tarus, 2015). Additionally, Tarus, Gichova and Muumbo cited the number of computers, network factors (affordable and adequate Internet bandwidth) and connectivity as major challenges to implementing online courses. These results correspond to the findings of this present study. Mckimm et al. (2003) found that major barriers to successfully implementing online teaching include the technology, easy access, and downloading speed, but did not include the design of the web page. These previous studies highlight that it is important to develop new strategies to reduce these structural challenges to increase completion rates.

2.a Use of Quality Improvement Techniques:

Overall, most facility were diligent in compiling their number of screening and brief interventions performed daily. However, very few facilities graphed their data weekly as was suggested to participants to track the impact of their change ideas on a weekly basis. Most reported graphing the data monthly. The most common change idea was simplifying the screening tool and screening from all points of entry within the primary care facilities. Most interestingly, it emerged during the FGD that there was a concurrent "Kenyan QI" being implemented alongside eDATA K. While the Kenyan QI was only briefly mentioned, the similarity of the two models was highlighted by one of the clinicians. This clinician did not mention how this impacted them, whether it increased their motivation, or their own personal opinion of the Kenyan QI. This highlights a specific topic of interest for further research.

Through an informal interview with the AMHF Coordinator of eDATA K, they also did not know a lot of information about the Kenyan QI, but they did provide a web link which highlighted that USAID was funding the roll-out of the Kenya Quality Model for Health (KQMH) which incorporated similar tools to eDATA K's practice support, including other online information ("Kenya Quality Model for Health: A Training Course for the Health Sector | USAID ASSIST Project," n.d.). Further information on the KQMH is available at:

https://www.usaidassist.org/resources/kenya-quality-model-health-training-course-health-sector.

To the best of our knowledge no studies have examined the impact or experience of primary health care workers using blended online and in-person QI training to improve screening and brief intervention for SUD. Therefore, these results represent novel information and can inform the conduct of further studies and online programs conducted in LMIC.

2.b Applicability/ Transferability:

From the FGD it emerged that participants had applied knowledge from the online course in their community, with family members and in other areas at work (health care setting). Furthermore, participants had discussed how they had exchanged information and ideas between other health workers. These findings suggested a strong understanding of the course material and highlighted the applicability or transferability of the information from the blended course. There are few studies that have previously examined the applicability or transferability of skills from an online QI course. Therefore,

these results are new knowledge that can be used in future studies, and inform online learning practice.

2.c Empowerment and Sustainability:

From the FGD and KII, participants reported feeling "more confident" and "more capable" to deal with "drunkards" after having completed the course. Therefore, the participants perceived that self-efficacy increased from completing the blended course, which empowered participants to integrate and sustain screening and provide brief intervention to patients in the primary health care setting. Increased self-efficacy was most likely due to the modules that focused on leadership, managing error and mistakes, and time management (NextGenU.org). Similarly, Thukral et al. (2012) conducted a study examining the future for online learning in developing countries. This study found that participants perceived confidence increased, which is comparable to the present study. Another study also found similar results during a Train-the-Trainer programme. The evaluation (3-months) indicated the participants had increased adherence, higher perceived knowledge and overall increased confidence (De Beurs et al., 2015).

When people have confidence (self-efficacy) in their ability to engage in activities without direct support, this will lead to positive long-term results. From the FGD, participants noted, "[they] have become addicted", which strongly suggests that the program was indeed sustainable and will continue in the future. As this is the first study to evaluate the success of using QI to improve SUD screening and services within primary health care settings, there is no available literature on the sustainability of such studies. However, the 'Project Fives Alive!' that was conducted in Ghana also showed

long-term sustainability, as their program had been scaled-up to 38 districts ("Lessons Learned from Ghana's Project Fives Alive !," n.d.).

2.d Structural – Environmental:

Two environmental factors emerged from the FGD and KII as challenges in the sustainability of integrating mental health services using QI in Makueni, which were: time and workload. These two factors have been abundantly cited in literature as challenging factors in implementing any program within LMIC. There is a well-documented lack of health care professionals at the primary-level and high workload for staff (Jenkins et al., 2010). QI is an effective model that uses available resources (both human and time) to make small-scale changes that can be sustained (Chinman et al., 2012; Patel et al., 2013). As such, in 2001, the Institute of Medicine proposed using a QI model to improve health and reduce the prevalence of psychoactive substance use in LMIC (Pincus et al., 2011). Therefore, while time and workload were environmental factors, it was possible for staff (participants) to develop different change ideas that reduced time and workload burden and improved screen and BI for patients with psychoactive substance use disorders. This would ultimately have a dual-benefit, both for the patient and health care professional, overall improving quality of life.

2.e Structural – Resource Management:

Overall, the participants perceived that management was not always the most supportive in relation to integrating mental health services using QI into Makueni primary health care. This was reported as a potential major barrier for long-term sustainability (past the more than 6 months follow-up from this study), and is also a factor identified in the literature as very important for sustainability (Hashmi et al., 2013;

Mohammadi et al., 2007). Hashmi et al. (2013) identified the support from hospital management as a key component in the success of their project. Additionally, Mohammdi et al. (2007) reported that support from management was integral to the success and long-term outcomes of their project (Mohammadi et al., 2007). While the literature suggests it is integral to have the support of management broadly, the results from this present study suggest that having even one strong, well-respected leaders within the facility being committed can help to support the long-term durability of the program.

2.f Impact of the training on awareness of substance use pattern, cultural implications and gender issues:

From the completion of the blended course, screener's general knowledge of substance use in their community was perceived to have increased. This could be due to the fact that screeners are less educated than clinicians and gained more information and knowledge from the course material, and their increase interaction with substance users. This also highlights the importance of general education on psychoactive substance disorders within Kenya. Similar results from an eLearning graduate clinical residency program found the participant's pre- versus post-test score was significantly higher (Hemans-Henry, Greene, & Koppaka, 2012). However, Hemans-Henry, Greene & Koppaka (2012) noted that follow-up was not conducted which was a limitation to whether knowledge was retained long-term. Whereas, eDATA K's practice-improvement did conduct at least 6-month of follow-up data collection post online learning, , and during the FGD and KII participants indicated they perceived they had a good understanding of the material. In a study that conducted a randomized, control, single-blinded trial of teaching using a computer-based package versus lecture, William, Aubin,

Harkin & Cottrell (2001) found students who used the computer-package had perceived they had learned significantly less. However, a subjective assessment showed they had stronger skills as compared to those who took a lecture-based course (Williams, Aubin, Harkin, & Cottrell, 2001). This finding is interesting, as perceived knowledge was less, which was not similar to the blended course, but that subjective assessment did show similar results. This contrast in results highlights an area for future research.

2.g Stigma:

Participants reported that there was a strong cultural norm in Kenya in regards to SUD that prevented women from feeling comfortable to openly discuss their drinking or substance use habits, as they were concerned the community as well as health care professionals would perceive them negatively. Certain tribes (Masaii) had cultural norms that prevented women from talking to men about their intake of substances. Additionally, a shift in stigma from health professionals emerged from the FGD and KII, as their attitude positively changed towards individuals who struggled with substance use disorders. Van Boekel, Brouwers, Van Weeghel, & Garretsen (2013) similarly found that generally health professionals had a negative attitude towards patients with substance use. Although, this study only examined Western countries, the results are similar to this present study. Additionally, Van Boekel et al., 2013 found that health professionals with a specialization in addiction services had more positive attitude towards individuals with substance use disorders as compared to primary health care staff. This highlights that possibly through using a QI model which has constant reflection this helped to increase awareness and shift attitudes related to SUD. Livingston, Milne, Fang, & Amari (2012) found opposing results in a systematic review that evaluated stigma related to SUD,

which found social stigma reduced when people with substance use disorder were depicted positively, but that solely providing individuals with educational brochures did not change stigma levels. However, this study also found that including self-reflection mechanisms into health professional's daily routine improved stigma towards individuals who had substance use disorders (Livingston et al., 2012). These results are similar to IHI's Improvement model that included self-reflection mechanisms. Overall, the positive shift in attitude towards patient with SUD will have a positive impact in the rural community in Kenya.

Future Recommendations:

The most commonly reported recommendation from clinicians, health officials and screeners was the inclusion of Africans in the videos and examples to create a more culturally appropriate and relevant course for Kenyans. As the NextGenU model uses available free learning object online, and does not create original content, the inclusion of more African content will be dependent on the generation and publication of that content online by other organizations. Alternatively, if NextGenU or AMHF obtained funds to create that content, perhaps a switch in the NextGenU model would occur, but in the meantime, the "free" nature of the NextGenU courses relies on the learning objects being freely available online.

A second recommendation was to change the format/design of the course web pages so that the each page would download quicker. This had been considered by NextGenU, and found to be technically challenging, other than perhaps participants having access to faster networks.

From both the participant's feedback and the researchers observations, the learning sessions were a key component in the success of the blended online course. Future online courses in LMIC would be highly recommended to follow a blended format. It is our understanding that without inclusion of this component, participants would have been confused and course material may not have been as "ingrained" into participant's memory.

Strengths and Limitations:

Strengths

There were five strengths of this study. First, the pragmatic design created a real life situation that involved several facilities (different sizes and health system levels) in a typical Kenyan county, which took into consideration socioeconomic status and availability of health care workers in the county. Therefore, the results are likely valid and replicable in similar counties. Second, the in-depth data collection process included focus groups, key informant interviews and field observations, which enriched the data and created more reliable results through triangulation. Third, there was a comprehensive iterative process of constant-comparison analysis and double-analysis (by a Canadian and a Kenyan local to the area) also contributed to a comprehensive and reliable interpretation reflecting the Kenyan context. Fourth, there was strong support from the literature review that supported the course was feasible and sustainable. Finally, the minimal use of supplementary technology (i.e.: computer in each primary care facility and extra internet provision) supports the results that this model is sustainable and can be scaled-up in similar contexts.

Limitations

This study was only conducted in one county therefore; the results may not be generalizable to all other Kenyan counties, or LMICs, which have varied characteristics, including the likelihood that some other jurisdictions experience lower level of commitment from higher management levels to improving mental health services. Finally, in Kenya there is currently a rapid uptake of smartphone applications as compared to computers and the use of computer-based learning application may have had a limited reach as compared to using smartphone applications.

CONCLUSION:

This innovative study demonstrates that online learning, with in-person learning sessions, can be an effective way to teach QI methods leading to sustain improvement in health services in a LMIC even in the context of limited access to computers and Internet, and human resources challenges. Based upon the experiences expressed in the FGD and KII, the course was perceived to be successful. Although there were structural challenges, participants created innovative strategies to complete the course. Key motivations, such as personal reasons to improve health services, as identified by participants are important to consider in future research and programs that teach and train health workers through a blended format. The QI model was successfully integrated and sustained. Most importantly, the results found that QI empowers primary health care staff to take initiative through an iterative process to find out what works in their local context. Through using QI, mental health services, specifically screening and brief intervention have improved in rural Kenya. This study provides crucial new knowledge on how to effectively support primary health care staff to improve services in LMIC and provides a

strong foundation for further research looking at scalability of the model to other,

countries (even high income countries who still struggle to implement quality

improvement methods broadly and effectively), and other areas of mental health and

health care in general.

Bibliography

Ali, R., Awwad, E., Babor, T. F., Bradley, F., Butau, T., Farrell, M., … Vendetti, J.
    (2002). The Alcohol, Smoking and Substance Involvement Screening Test
    (ASSIST): Development, reliability and feasibility. *Addiction*, *97*(9), 1183–1194.
    http://doi.org/10.1046/j.1360-0443.2002.00185.x

Asarnow, J. R., Jaycox, L. H., Duan, N., LaBorde, A. P., Rea, M. M., Murray, P., …
    Wells, K. (200AD). Effectiveness of a Quality Improvement Intervention for
    Adolescent Depression in Primary Care Clinics: A Randomized Controlled Trial.
    JAMA: The Journal of the American Medical Association, *293*(3), 311–319.
    http://doi.org/10.1016/S0084-3970(08)70061-6

Chinman, M., Hunter, S. B., & Ebener, P. (2012). Employing continuous quality
    improvement in community- based substance abuse programs. *International Journal
    of Health Care Quality Assurance*, *25*(7), 604–617.
    http://doi.org/10.1108/09526861211261208

Choo, S., Papandria, D., Goldstein, S. D., Perry, H., Hesse, A. a J., Abatanga, F., &

Abdullah, F. (2013). Quality improvement activities for surgical services at district hospitals in developing countries and perceived barriers to quality improvement: findings from Ghana and the scientific literature. *World Journal of Surgery*, *37*(11), 2512–9. http://doi.org/10.1007/s00268-013-2169-4

De Beurs, D. P., De Groot, M. H., De Keijser, J., Mokkenstorm, J., Van Duijn, E., De Winter, R. F. P., & Kerkhof, A. J. F. M. (2015). The effect of an e-learning supported Train-the-Trainer programme on implementation of suicide guidelines in mental health care. *Journal of Affective Disorders*, *175*, 446–453. http://doi.org/10.1016/j.jad.2015.01.046

Diagnostic and Statistical Manual of Mental Disorders. (2013). American Psychiatric Association. http://doi.org/10.1176/appi.books.9780890425596

Franco, L. M., & Marquez, L. (2011). Effectiveness of collaborative improvement: evidence from 27 applications in 12 less-developed and middle-income countries. *BMJ Quality & Safety*, *20*(8), 658–665. http://doi.org/10.1136/bmjqs.2010.044388

Hashmi, Z. G., Haider, A. H., Zafar, S. N., Kisat, M., Moosa, A., Siddiqui, F., … Zafar, H. (2013). Hospital-based trauma quality improvement initiatives. *Journal of Trauma and Acute Care Surgery*, *75*(1), 60–68. http://doi.org/10.1097/TA.0b013e31829880a0

Health, M., & Action, G. (n.d.). mhGAP Intervention Guide.

Hemans-Henry, C., Greene, C. M., & Koppaka, R. (2012). Integrating public health-oriented e-learning into graduate medical education. *American Journal of Public Health*, *102*(SUPPL. 3), S103–S106. http://doi.org/10.2105/AJPH.2012.300669

Hew, K. F., & Cheung, W. S. (2014). Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. *Educational Research Review*, *12*, 45–58. http://doi.org/10.1016/j.edurev.2014.05.001

Hoffman, K. A., Green, C. A., Ford, J. H., Wisdom, J. P., Gustafson, D. H., & McCarty, D. (2012). Improving quality of care in substance abuse treatment using five key process improvement principles. *The Journal of Behavioral Health Services & Research*, *39*(3), 234–44. http://doi.org/10.1007/s11414-011-9270-y

Hunter, S. B., Ober, A. J., Paddock, S. M., Hunt, P. E., & Levan, D. (2014). Continuous quality improvement (CQI) in addiction treatment settings: design and intervention protocol of a group randomized pilot study. *Addiction Science & Clinical Practice*, *9*, 4. http://doi.org/10.1186/1940-0640-9-4

Institute for Healthcare Improvement: Science of Improvement: How to Improve. (n.d.). Retrieved February 28, 2016, from http://www.ihi.org/resources/pages/howtoimprove/scienceofimprovementhowtoimprove.aspx

Jenkins, R., Kiima, D., Njenga, F., Okonji, M., Kingora, J., Kathuku, D., & Lock, S. (2010). Integration of mental health into primary care in Kenya. *World Psychiatry*, *9*(2), 118–120. http://doi.org/10.1002/j.2051-5545.2010.tb00289.x

Kenya Quality Model for Health: A Training Course for the Health Sector | USAID ASSIST Project. (n.d.). Retrieved March 27, 2016, from https://www.usaidassist.org/resources/kenya-quality-model-health-training-course-health-sector

Kiima, D. M., Njenga, F. G., Okonji, M. M. O., & Kigamwa, P. A. (2004). Kenya mental health country profile. *International Review of Psychiatry*, *16*(1-2), 48–53.

http://doi.org/10.1080/09540260310001635096

Leatherman, S., Ferris, T. G., Berwick, D., Omaswa, F., & Cris, P. (2010). The role of quality improvement in strengthening health systems in developing countries. *International Journal for Quality in Health Care*, *22*(4), 237–243. http://doi.org/10.1093/intqhc/mzq028

Lessons Learned from Ghana ' s Project Fives Alive ! (n.d.).

Lim, S. S., Vos, T., Flaxman, A. D., Danaei, G., Shibuya, K., Adair-Rohani, H., … Ezzati, M. (2012). A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: A systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*, *380*(9859), 2224–2260. http://doi.org/10.1016/S0140-6736(12)61766-8

Lindberg, M., Vergara, C., Wild-Wesley, R., & Gruman, C. (2006). Physicians-in-training attitudes toward caring for and working with patients with alcohol and drug abuse diagnoses. *Southern Jedical Journal*, *99*(1), 28–35. http://doi.org/10.1097/01.smj.0000197514.83606.95

Livingston, J. D., Milne, T., Fang, M. L., & Amari, E. (2012). The effectiveness of interventions for reducing stigma related to substance use disorders: A systematic review. *Addiction*, *107*(1), 39–50. http://doi.org/10.1111/j.1360-0443.2011.03601.x

Lund, C., Tomlinson, M., de Silva, M., Fekadu, A., Shidhaye, R., Jordans, M., … Patel, V. (2012). PRIME: A Programme to Reduce the Treatment Gap for Mental Disorders in Five Low- and Middle-Income Countries. *PLoS Medicine*, *9*(12). http://doi.org/10.1371/journal.pmed.1001359

Marangu, E., Sands, N., Rolley, J., Ndetei, D., & Mansouri, F. (2014). Mental healthcare in Kenya: Exploring optimal conditions for capacity building. *Afr J Prm Health Care Fam Med*, *6*(1), 5 pgs. http://doi.org/10.4102/phcfm.v6i1.682

Mckimm, J., Jollie, C., & Cantillon, P. (2003). Abc Of Learning And Teaching : Web Based Learning ABC of learning and teaching Web based learning Your computer internet Servers. *British Medical Journal*, *326*(7394), 870–873. Retrieved from http://www.jstor.org.proxy-fs.researchport.umd.edu/stable/25454244

Memiah, P., Shumba, C., Henley, Y., Mwakyusa, S., Maghimbi, A., Komba, P., … Alexander, C. (2014). "Know your CD4 campaign": 6-year outcomes from a quality improvement initiative to promote earlier initiation of antiretroviral therapy in Tanzania. *International Journal of Medicine and Public Health*, *4*(3), 194. http://doi.org/10.4103/2230-8598.137701

Mohammadi, S. M., Mohammadi, S. F., Hedges, J. R., Zohrabi, M., & Ameli, O. (2007). Introduction of a quality improvement program in a children's hospital in Tehran: design, implementation, evaluation and lessons learned. *Int J Qual Health Care*, *19*(4), 237–243. http://doi.org/mzm021 [pii]\r10.1093/intqhc/mzm021

Nacada. (2012). Rapid Situation Assessment of the Status of Drug and Substance Abuse.

NextGenU.org The world's first portal to free, accredited, health education: Login to the site. (n.d.). Retrieved March 3, 2016, from https://nextgenu.org/login/index.php

Onwuegbuzie, A. J., Dickinson, W. B., Leech, N. L., & Zoran, A. G. (2009). A Qualitative Framework for Collecting and Analyzing Data in Focus Group Research. *International Journal of Qualitative Methods*, *8*, 1–21. Retrieved from http://libproxy.unm.edu/login?url=http://search.ebscohost.com/login.aspx?direct=tru e&db=a9h&AN=51827937&site=eds-

live&scope=site\nhttp://content.ebscohost.com.libproxy.unm.edu/ContentServer.asp ?T=P&P=AN&K=51827937&S=R&D=a9h&EbscoContent=dGJyMNLr40SeprI4y9

Othieno, C., Jenkins, R., Okeyo, S., Aruwa, J., Wallcraft, J., & Jenkins, B. (2013). Perspectives and concerns of clients at primary health care facilities involved in evaluation of a national mental health training programme for primary care in Kenya. *International Journal of Mental Health Systems*, *7*(1), 5. http://doi.org/10.1186/1752-4458-7-5

Patel, V., Belkin, G. S., Chockalingam, A., Cooper, J., Saxena, S., & Un??tzer, J. (2013). Grand Challenges: Integrating Mental Health Services into Priority Health Care Platforms. *PLoS Medicine*, *10*(5). http://doi.org/10.1371/journal.pmed.1001448

Pincus, H. A., Spaeth-Rublee, B., & Watkins, K. E. (2011). Analysis and commentary: The case for measuring quality in mental health and substance abuse care. *Health Affairs*, *30*(4), 730–736. http://doi.org/10.1377/hlthaff.2011.0268

Pomerantz, A. M. (2013). Chapter 7 - What Defines Abnormality? *Clinical Psychology*, 151–181. Retrieved from http://www.sagepub.com/sites/default/files/upm-binaries/58622_Chapter_7_Pomerantz_(Clinical)_I_Proof_(Low_Res)_4.pdf

Report, I. C. (2012). Project Fives Alive !, 1–16.

Rigby, L., Wilson, I., Baker, J., Walton, T., Price, O., Dunne, K., & Keeley, P. (2012). The development and evaluation of a "blended" enquiry based learning model for mental health nursing students: "making your experience count." *Nurse Education Today*, *32*(3), 303–308. http://doi.org/10.1016/j.nedt.2011.02.009

Saraceno, B., van Ommeren, M., Batniji, R., Cohen, A., Gureje, O., Mahoney, J., … Underhill, C. (2007). Barriers to improvement of mental health services in low-income and middle-income countries. *The Lancet*, *370*(9593), 1164–1174. http://doi.org/10.1016/S0140-6736(07)61263-X

Snape, D., & Spencer, L. (2003). The Foundations of Qualitative Research. *Qualitative Research Practice: A Guide for Social Science Students and Researchers*, 2–10. http://doi.org/10.4135/9781452230108

Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: Student perceptions of useful and challenging characteristics. *Internet and Higher Education*, *7*(1), 59–70. http://doi.org/10.1016/j.iheduc.2003.11.003

Tarus, J. (2015). Challenges of Implementing E-Learning in Kenya : A Case of Kenyan Public Universities Challenges of Implementing E-Learning in Kenya : A Case of Kenyan Public Universities, *16*(JANUARY), 120–142.

Thukral, A., Sasi, A., Chawla, D., Datta, P., Wahid, S., Rao, S., … Deorari, A. K. (2012). Online neonatal training and orientation programme in india (ONTOP-IN)-the way forward for distance education in developing countries. *Journal of Tropical Pediatrics*, *58*(6), 486–490. http://doi.org/10.1093/tropej/fms029

Tsai, A. C., & Tomlinson, M. (2015). Inequitable and Ineffective: Exclusion of Mental Health from the Post-2015 Development Agenda. *PLoS Medicine*, *12*(6), e1001846. http://doi.org/10.1371/journal.pmed.1001846

Van Boekel, L. C., Brouwers, E. P. M., Van Weeghel, J., & Garretsen, H. F. L. (2013). Stigma among health professionals towards patients with substance use disorders and its consequences for healthcare delivery: Systematic review. *Drug and Alcohol Dependence*, *131*(1-3), 23–35. http://doi.org/10.1016/j.drugalcdep.2013.02.018

Whiteford, H. A., Degenhardt, L., Rehm, J., Baxter, A. J., Ferrari, A. J., Erskine, H. E.,

… Vos, T. (2013). Global burden of disease attributable to mental and substance use disorders: Findings from the Global Burden of Disease Study 2010. *The Lancet*, *382*(9904), 1575–1586. http://doi.org/10.1016/S0140-6736(13)61611-6

WHO. (2010). The alcohol, smoking and substance involvement screening test (ASSIST). …, 1–74. http://doi.org/10.1111/j.1360-0443.2007.02114.x

WHO | WHO Mental Health Gap Action Programme (mhGAP). (n.d.). Retrieved from http://www.who.int/mental_health/mhgap/en/

Williams, C., Aubin, S., Harkin, P., & Cottrell, D. (2001). A randomized, controlled, single-blind trial of teaching provided by a computer-based multimedia package versus lecture. *Medical Education*, *35*(9), 847–854. http://doi.org/10.1046/j.1365-2923.2001.00960.x

World Health Organization. (2011). Mental Health Atlas 2011. *World Health Organization*, 1–81. http://doi.org/10.1093/bja/aes067