EFFECT OF WEB-BASED TRAINING IN PREVENTION AND MANAGEMENT OF SUBSTANCE USE DISORDERS (SUDs) ON STRUCTURAL STIGMA AMONG HEALTHCARE WORKERS IN SELECTED FACILITIES IN NAIROBI, MACHAKOS AND MAKUENI COUNTIES, KENYA

AGGREY GISIORA MOKAYA

MASTER OF SCIENCE IN

(Public Health)

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Effect of Web-Based Training in Prevention and Management of Substance Use Disorders (SUDs) on Structural Stigma among Healthcare Workers in Selected Facilities in Nairobi, Machakos and Makueni Counties, Kenya

Aggrey Gisiora Mokaya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

Signature …… Date ……..

Aggrey Gisiora Mokaya

This thesis has been submitted for examination with our approval as University supervisors.

Signature …… Date ……..

Prof. Zipporah Ng'ang'a

JKUAT - Kenya

Signature …… Date ……..

Dr. Yeri Kombe

KEMRI - Kenya

Signature …… Date ……..

Dr.Victoria Mutiso

AMHF - Kenya

DEDICATION

This thesis is dedicated to all personnel in the Kenyan healthcare system as well as those in society who are struggling with addiction to alcohol, tobacco and drug use disorders.

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ABBREVIATIONS AND ACRONYMS

AMHF	Africa Mental Health Foundation
ASSIST	Alcohol, Smoking and Substance Involvement Screening Test
AUD	Alcohol Use Disorder
BAC	Blood Alcohol Concentration
BC	British Columbia
BSCS	Biological Sciences Curriculum Study
CPHR	Centre for Public Health Research
DHMT	District Health Management Team
ERC	Ethics Review Committee
HCW	Healthcare Worker
IBM SPSS	International Business Machines' Statistical Package for the Social Sciences
KEMRI	Kenya Medical Research Institute
LMIC	Low and Middle Income Countries
NACADA	National Authority for Campaign against Alcohol and Drug Abuse
NCD	Non-communicable Disease
OMS-HC	Opening Minds Scale for Healthcare Workers

RCT	Randomized Controlled Trial
SSC	Scientific Steering Committee
SUD	Substance Use Disorder
TUD	Tobacco Use Disorder
WBT	Web-based Training
WHO	World Health Organization

OPERATIONAL TERMS

Alcohol	A beverage that contains ethanol: could be beer, wine or spirits.
Alcohol Use Disorder	A problematic pattern of alcohol use leading to clinically significant impairment or distress. Characterized by drinking more and longer than intended, inability to stop or cut down, craving, hampered social function, co-morbidities such as depression among others.
Drug	Also referred to as substance, any compound that, when ingested and absorbed into the body of a living organism, alters normal bodily function.
Stigma	A set of negative and often unfair beliefs that a society or group of people have about something
Substance	Psychoactive substance. Something (as alcohol, methamphetamine, or marijuana) deemed harmful and usually subject to legal restriction.
Substance Use Disorder	Refers to the overuse of, or dependence on, a drug leading to effects that are detrimental to the individual's physical and mental health, or the welfare of others. Often used as a general term for alcohol, tobacco and drug use disorders.
Tobacco Use Disorder	Tobacco use disorder occurs when the use of tobacco harms a person's health or social functioning, or when a person becomes dependent on tobacco.

ABSTRACT

The rise of alcohol, tobacco and substance use in Kenya today necessitates a hands-on and cost-effective approach to reverse this trend. Studies show that primary healthcare workers are best placed to provide necessary screening and treatment of alcohol, tobacco and substance use disorders. Major obstacles to the effectiveness, uptake and patient adherence to these interventions are lack of knowledge about alcohol, tobacco and substance use and negative attitudes and stigma towards sufferers of substance use disorders held by health care workers. An innovative, evidence supported and cost effective solution is to provide Web-based training on substance use disorders and their treatment to primary health professionals. This study sought to evaluate the effect of a web-based training in SUD on health worker knowledge, attitudes, and levels of stigma towards people with alcohol, tobacco and substance use disorders. A prospective before and after design was used. Data was collected using the Opening Minds Scale for Healthcare workers and a KAP Survey, in 11 health facilities located in Nairobi, Machakos and Makueni Counties of Kenya. A total of 102 healthcare workers completed the pre-test, the training intervention and the post-test survey. Paired t-tests showed statistically significantly lowered levels of stigma after the training compared to before the training. The stigma scores reduced on average by 2.91 (CI: 0.85 - 4.97, p=0.006), 3.04 (CI: 0.98 - 5.10, p=0.001) and 2.71 (CI: 0.62 - 4.81, p=0.011) for stigma towards people with alcohol, substance and tobacco use disorders, respectively. The reduction seen in the overall stigma levels was related to decrease in social distance and self-stigma and increased social responsibility among the respondents after web-based training. After web-based training, knowledge and skills surrounding substance use disorder screening and case management improved. The study found higher rates of substance use among healthcare workers compared to the general Kenyan population - placing them at moderate to high risk of developing substance use disorders. These findings indicate that web-based training has an overall positive effect on a stigma among healthcare workers. It is a promising approach for not only improving attitudes but also providing knowledge and skills to healthcare providers in a cost-effective manner. It is recommended that the training be rolled out

countrywide to combat stigma against people with these disorders. More research should be done on the dimensions of stigma to understand how to target them specifically.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Stigma is defined as a mark of disgrace that sets an individual apart from the rest. It is the basis for a negative mind set or prejudice towards that individual which translates into negative action i.e. discrimination. People with alcohol, tobacco and substance use disorders are often stigmatized in society (Keyes *et al.*, 2010; Ritson, 1999). Indeed, health professionals and members of the public often view their conditions as self-inflicted and undeserving of their attention or time (Ritson, 1999).

Alcohol is one of the most commonly consumed substances in the world. It is estimated that almost 2 billion people on the planet consume alcohol. Of these, more than 75 million suffer from alcohol use disorders (WHO, 2011). The 2010 WHO global status report on non-communicable diseases (NCDs) lists the harmful use of alcohol and tobacco as two of the four main behavioural risk factors for NCDs, alongside physical inactivity and unhealthy diet (Alwan, 2011). It is estimated that the harmful use of alcohol, tobacco, and illicit substances are responsible, respectively, for 4.5%, 3.7% and 0.9% of the global disease burden (WHO, 2011; Alwan, 2011).Yet more worrisome is the rate by which the burden of disease from substance use is increasing, by almost 40% in the 20 years between 1990 and 2010 (Whiteford *et al.*, 2013), with 32% of the increase attributable to alcohol use, 57% to substance use, and 3% to tobacco use. In comparison, other important sources of disease burden that have been the source of concerted efforts worldwide have decreased, such as childhood under nutrition (Lim *et al.*, 2012).

An Alcohol Use Disorder is a maladaptive pattern in which a person's intake of alcohol is great enough to damage or adversely affect physical or mental health or personal, social, or occupational function; or when alcohol has become a prerequisite to normal function. In this regard, the term alcohol use disorder encompasses both alcohol abuse and alcohol dependence (APA, 2013). It is estimated that 1.47% of adult males and

0.16% of adult females in Kenya suffer from alcohol use disorders (WHO, 2011). Alcohol and substance use disorders in Kenya are fairly widespread in both urban and rural areas (Shaffer, Njeri, Justice, Odero, & Tierney, 2004). Indeed the availability of cheap home-made brews propagates alcohol use in Kenyan society (Lo *et al.*, 2013). The term tobacco use disorder describes the use of tobacco "to the detriment of a person's health or social functioning." Tobacco dependence is also included in this definition (Kalman, Kim, DiGirolamo, Smelson, & Ziedonis, 2010). Similarly, the term substance use disorder encompasses both dependence on and abuse of drugs usually taken voluntarily for the purpose of their effect on the central nervous system (usually referred to as intoxication or "high") or to prevent or reduce withdrawal symptoms (Kalman *et al.*, 2010).

1.2 Statement of the Problem

According to the National Campaign against Drug Abuse (NACADA), alcohol, tobacco and drug use in Kenya is on the rise (NACADA, 2012, 2014).This is due to increasing access to various forms of these substances in the Kenyan society - especially in Nairobi and Mombasa (NACADA, 2014). This is problematic because harmful alcohol use and tobacco use are two of four behavioural risk factors for non-communicable diseases (Mendis *et al.*, 2014). Further, the patterns of use of these substances pose problems to the public health system that cannot be ignored. Recent studies show that the proportion of mortality attributed to disorders associated with the use of these substances, is far higher than previously thought (Roerecke & Rehm, 2013).

This significant and growing burden of disease from Substance Use Disorder (SUD) calls for the implementation of evidence-based interventions. SUD is a subset of mental illness, characterized by problematic patterns of using one or several substances with overt distress and impairment (APA, 2013). In order to successfully implement these interventions, stigma against those who use substances needs to be addressed. Stigma poses a significant barrier to provision of and access to effective care and policy interventions for those in need. Stigma, and lack of investment in effective

interventions can render those affected unable or unwilling to seek help for their conditions (Bayer, 2008).

People suffering from SUD are frequently stigmatized with important negative health and social consequences (Ritson, 1999; Keyes *et al.*, 2010). Healthcare professionals, policymakers, and members of the public often view substance use disorders as self-inflicted, and perceive that treating SUD takes time and resources away from other patients, more so than treating other mental illnesses (Ritson, 1999; Schomerus *et al.*, 2015; Schomerus *et al.*, 2011). Regardless of training background or level of education, from community health workers to highly trained specialists, studies have demonstrated that stigma does exist among healthcare workers in general and around the world – and this has been a recurring theme in the past 15 years (Foster *et al.*, 2008; Han *et al.*, 2014; Jorm, Korten, Jacomb, Christensen, & Henderson, 1999). Furthermore, stigma by health professionals reduces adherence to treatment interventions (Horsfall, Cleary, & Hunt, 2010).

Collectively, pervasion of these negative attitudes impedes implementation of effective and evidence-based interventions, such as brief interventions (Kaner *et al.*, 2007). This is especially problematic in low and middle-income countries (LMIC), where interventions are most needed, since LMIC bear the majority of the disease burden from SUD (Daar *et al.*, 2014; Gureje, Chisholm, Kola, Lasebikan, & Saxena, 2007; Saxena, Thornicroft, Knapp, & Whiteford, 2007). If implemented, these interventions would reduce many of the ills associated with alcohol, tobacco and substance use, including physical injuries, motor vehicle accidents, liver disease, lung diseases, and cardiovascular diseases, and would improve social functioning and productivity, thereby decreasing the negative economic consequences often associated with SUD.

1.3 Justification

It is hoped that findings from this study will be used to provide an overview of the effect of web-based training on the knowledge, attitudes and practice of healthcare

workers as far as alcohol, tobacco and substance use in Kenya is concerned. Further, it sheds some light on the level of stigma among healthcare workers. Lastly, it provides insights on use of web-based training to improve the knowledge and skills of HCWs in primary health care settings.

1.4 Research Questions

This study was expected to answer the following questions:

1. What is the difference in mean stigma score among health workers after web-based training in substance use disorders treatment and prevention?
2. What is the change in knowledge, attitudes and practice among health workers after web-based training in substance use disorders treatment and prevention?

1.5 Null Hypothesis (H_0)

There is no difference in mean stigma score of HCWs before and after web-based training in prevention and management of SUDs.

1.6 Main Objective

To determine the level of stigma, as well as knowledge, attitudes and practices of Healthcare workers regarding SUDs and evaluate the effect of web-based training on HCW stigma.

1.6.1 Specific Objectives

1. To determine the mean stigma score for Healthcare workers at baseline and post intervention.
2. To evaluate knowledge, attitudes and practices of Healthcare workers regarding substance use at baseline and post-intervention.

3. To determine the mean difference in stigma score of Healthcare workers, at baseline and post-intervention.
4. To evaluate changes in knowledge, attitudes and practices of trained Healthcare workers (on substance use), post-intervention.

CHAPTER TWO

LITERATURE REVIEW

2.1 Prevalence of Alcohol, Substance and Tobacco Use

The WHO global status report on NCDs lists harmful use of alcohol as one of the four main behavioural risk factors for NCDs alongside tobacco use, physical inactivity and unhealthy diet. It is estimated that the harmful use of alcohol is responsible for 4.5% of the global disease burden. This is especially worrisome given the fact that while NCDs take a long time to develop, poor lifestyle choices and unhealthy behaviours are rapidly on the rise (Alwan, 2011). Drug use pervades all spheres of human society (Wu, 2010). Combined with alcohol use, illicit drug use accounts for 5.4% of the world's annual disease burden (Alwan, 2011).

The global burden of substance use disorders increased markedly by almost 40% in the 20 years between 1990 and 2010 (Whiteford *et al.*, 2013). The WHO projects that by the year 2020, tobacco use will be responsible for 10% of mortality worldwide. This is especially noteworthy, when taking into account the fact that the highest incidence of smoking is among men in LMIC (Alwan, 2011). At the current rates of tobacco use, it is estimated that by 2030, up to half of the world's 1 billion tobacco users will die prematurely (Alwan, 2011).

The situation in sub-Saharan Africa mirrors this trend and studies done in the region show that the burden of use in sub-Saharan Africa is a leading contributor to this upsurge (Jamison, 2006). This is indeed a serious cause for concern (Gore *et al.*, 2011). Kenya's National Authority for the Campaign against Alcohol and Drug Abuse (NACADA) has commissioned studies to track the use of alcohol, tobacco and drugs (substances). The findings from these studies point to high rates of substance use (National Campaign Against Drug Abuse (NACADA), 2007; NACADA, 2012). The most recent survey indicates that while tobacco use may be declining, the age of onset for any substance use has fallen to just 10 years of age, while the prevalence of alcohol use is now at 13.3%. Indeed, many of Kenyan youth experiment with illicit drugs while

they are still in primary or secondary school (Kuria, 1996). This means that much younger individuals are using alcohol earlier and at increased rates than previously seen. Globally, marijuana (cannabis) remains the commonest substance of abuse (Budney, Roffman, Stephens, & Walker, 2007), and its use in Kenya is on the rise. The recent past has also seen an increase in the number of injecting drug users in Kenya (Beckerleg, Telfer, & Hundt, 2005).

2.2 Effects of Substance Use on the human body

Alcohol is an irritant and destabilizes the normal functioning of the body. Depending on the amount of alcohol consumed, as well as the duration of regular alcohol use, the effects of alcohol use can either be acute or chronic (Barclay, Barbour, Stewart, Day, & Gilvarry, 2008). Alcohol has various effects on the body physiology and behaviour. Depending on the type and amount of alcohol consumed, alcohol in the body can be quantified in terms of blood alcohol concentration (BAC). BAC is commonly measured as the mass of alcohol per volume of blood or mass of alcohol per mass of blood.

Alcohol intoxication as measured by BAC is a good basis for describing the progressive effects of alcohol consumption as shown in Table 2.1. Chronic alcohol use is associated with liver injury - including cirrhosis (Bruha, 2012), gastrointestinal maladies such as pancreatitis; and deleterious effects on the cardiovascular system (Ashley & Rankin, 1980). Research carried out in England and Wales indicates that illicit drug use has the potential to have serious negative effects on human health and well-being. Some of the consequences of acute and chronic drug use include, but are not limited to; fights, tendency towards criminal activities, premature aging and death, among others (Department of Health, 2011).

Table 2.1: The Progressive Effects of Alcohol in a Human Being

Blood Alcohol Concentration	Changes in Feelings and Personality	Physical and Mental Impairments
0.01 — 0.06	Relaxation Sense of Well-being Loss of Inhibition Lowered Alertness Joyous	Thought Judgment Coordination Concentration
0.06 — 0.10	Blunted Feelings Disinhibition Extroversion Impaired Sexual Pleasure	Reflexes Impaired Reasoning Depth Perception Distance Acuity Peripheral Vision Glare Recovery
0.11 — 0.20	Over-Expression Emotional Swings Angry or Sad Boisterous	Reaction Time Gross Motor Control Staggering Slurred Speech
0.21 — 0.29	Stupor Lose Understanding Impaired Sensations	Severe Motor Impairment Loss of Consciousness Memory Blackout
0.30 — 0.39	Severe Depression Unconsciousness Death Possible	Bladder Function Breathing Heart Rate
=> 0.40	Unconsciousness Death	Breathing Heart Rate

Note. Adapted from *Understanding Alcohol: Investigations into Biology and Behaviour Teacher's Guide* by (BSCS, 2003) Colorado Springs, CO

Light, irregular tobacco use has been shown to be just as harmful as regular or daily tobacco use. Light smokers are just as likely to develop cardiovascular disease as are

heavy smokers. And while, they are at a lower risk of developing lung cancer, the level of risk is still significant (Schane, Ling, & Glantz, 2010). Substance use disorders - including alcohol and tobacco use disorders contribute immensely to the global burden of disease (Whiteford *et al.*, 2013), especially among young people (Gore *et al.*, 2011). Tobacco use has been linked to cancer and other cardiovascular complications. Tobacco is also linked to poverty. It has been shown that in the poorest households in LMIC, 10% of the total income is spent on tobacco.

The situation in Kenya is not too different from the rest of the world and in some cases, studies have shown that the situation in Kenya, especially as regards alcohol use is far worse than in other countries across the globe (Saunders, Aasland, Amundsen, & Grant, 1993). These disorders cause not only physical but also social and economic problems that are severely detrimental, not only to individual lives, but also public health (Rehm *et al.*, 2009). Various misconceptions about alcohol and drug use (Kaur, 2014) among young people propagate its continued use in society today. These misconceptions, coupled with a clear lack of understanding of the long-term effects of alcohol use are of great concern (BSCS, 2003).

2.3 Management of Alcohol, Tobacco and Substance Use

Traditionally, it has fallen to psychiatrists to intervene when individuals use alcohol, tobacco or drugs in a harmful manner. However, in resource poor settings, there aren't enough specialists to go around. This necessitates a task-shifting approach to use primary care workers to provide interventions where they are needed the most (Othieno, Kathuku, & Ndetei, 2000).

In light of this, there is a need to train primary healthcare workers to intervene and reverse the soaring trends of alcohol, tobacco and substance use in low income countries. Primary health care practitioners are the first line of contact that most individuals have with the health system, this means that this cadre of health workers has the highest need for any training or continuing education. However, in a world of diminishing resources, there is a need for innovative and cost-effective approaches that

can bring much needed help to those who need it the most (Patel, 2009). Studies show that it is more cost effective to train larger numbers of primary health care workers than to train specialists (Petersen, Lund, Bhana, Flisher, & Mental Health and Poverty Research Programme Consortium, 2012).

2.4 Stigma in the Society

A study on public attitudes towards alcohol dependence in Germany concluded that alcohol dependence is severely stigmatized. Although most people view it as an illness, the desire for social distance from persons with AUDs is higher than that for those with depression or schizophrenia. In addition to this personal rejection, treatment for AUDs ranks low among public priorities. Indeed, were many people to have their way, these treatment programs would be done away with to save money for more "worthy" causes (Georg Schomerus, Holzinger, Matschinger, Lucht, & Angermeyer, 2010). In LMIC, the low priority with which mental health issues are treated (Desjarlais, 1995) may potentially provide opportunities for stigmatization of mental ill health, including AUDs.

Studies have shown different stigma for SUDs compared to other mental illnesses (Schomerus *et al.*, 2011). It is therefore quite possible, along this vein, that AUDs, SUDs and TUDs are stigmatized differently. Stigma is not only limited to the general public but even permeates to state actors. A study on Stigma, social inequalities and alcohol and drug use, indicates that stigma may have a part to play in policy formulation for alcohol and drug use in a country as well as decisions made by social and health agencies. This means that the stigma that already generally exists in the society is further compounded by marginalization of people who suffer from alcohol, tobacco and substance use disorders. When is coupled with poverty, the result is untold misery and suffering (Room, 2005).

Studies have shown that the sum total of socially accepted but negative attitudes held in society towards people with substance use disorders, contribute largely to these individuals being unable or unwilling to seek the help that they need for their

conditions (Bayer, 2008). There is increasing interest in reduction of health-related stigma around the world, more so around substance use disorders (Livingston, Milne, Fang, & Amari, 2012). Stigma among healthcare professionals has also been documented. A 2006 study among medical students and medical residents in the USA found that there was a shared perception across the board that caring for patients with AUDs and SUDs takes away time and resources from other patients (Lindberg, Vergara, Wild-Wesley, & Gruman, 2006).

Many tobacco control groups propose the use of de-normalization strategies to curb tobacco use by attempting to influence the social behaviour around tobacco use. This has two effects; decreasing the social acceptability of smoking and increasing social stigma against smokers (Voigt, 2011). This approach begs the question of whether or not the greater good is served by discriminating against an already socially vulnerable group of people.

2.5 Strategies for combating Stigma

Many writers extol three main strategies for eliminating stigma; protest, education and contact. Studies have shown that protest – defined as, "telling the public to stop believing negative views about a condition" – can be counterproductive and cause an increase in stigma. However, informing or educating people on a subject has been shown to reduce stigma in general terms. Increased contact with people suffering from mental illness – also known as contact-based education – appears to have had marked success in reducing stigma at the individual level (Penn & Couture, 2002).

It is then suggestive that efforts to increase the knowledge of people, more so health care workers, on alcohol, tobacco and substance use disorders may have a beneficial effect on their attitudes and ability to empathize with the patients in practice (Patel, 2007). Education has been recognized by many as a tool to combat stereotypes (Schomerus, 2011). It then follows that if the negative attitude is changed or challenged the negative action (discrimination) is also changed. For any training to be

effective, however, it must go beyond increasing knowledge and have an impact on the mind-set of the learners.

2.6 Web-based Training

An innovative, evidence supported and cost effective solution is to provide Web-based training (WBT) on SUDs and their treatment to various health primary health professionals. WBT, sometimes referred to as e-learning or e-instruction, is defined by Oxford's online dictionary as "learning conducted via electronic media, typically on the Internet." It is a form of distance learning that allows the trainer to present the most current information, which can easily be modified in real time. This gives rise to a mode of learning that is self-directed or self-paced (Ai & Laffey, 2007). For the success of this model, however, the learner (end-user) must have the requisite computing skills, the relevant software and hardware as well as internet connectivity. Additionally, studies have shown that learners spend a lot of time on supplementary resources during web-based learning (Garrison, Schardt, & Kochi, 2000) and this may sometimes give the perception that the training is longer than it actually is.

Web-based training has been piloted successfully in the past to increase the knowledge and improve the attitudes of health care workers in primary care settings. A study in the USA showed that this format of training is both feasible and able to impact on the knowledge and attitudes of primary care workers while imparting important skills to them (Yank, Laurent, Plant, & Lorig, 2013). Indeed, studies have shown that web-based training is effective in reducing stigma towards mental illnesses in general (Griffiths, Christensen, Jorm, Evans, & Groves, 2004; Finkelstein & Lapshin, 2007). Studies show that web based training is an important strategy for training primary health care workers when due consideration is given to the situation of diminishing resources (Ballew *et al.*, 2012).

NextGenU.org is an online portal that delivers accredited, competency based and open access education ("NextGenU.org," 2013). NextGenU.org partnered with AMHF to create an online competency based training on substance use prevention and treatment

that was localized and accredited for the Kenyan setting (http://www.nextgenu.org/pages/courses.php). Learners were able to access the course materials and evaluations online as well as interact with mentors and peers (other trainees) in various competency based learning activities. This model has been successfully used to train individuals in more than 100 countries ("NextGenU.org," 2013). It is potentially the most cost-effective means of training health professionals, thus making it exceptionally appealing to LMICs, and has the ability and potential to be easily scaled up.

2.7 Public Health Importance of the Study

This study has implications for the practice of Public Health that are not easily cast aside. Foremost, a negative attitude on the part of the caregiver towards the patient results in stigma and lowers the likelihood of patient adherence to a given intervention. Studies have shown that when patients perceive stigma in treatment, they are less likely to adhere to treatment interventions (Sirey *et al.*, 2001). It is, however, worth mentioning that increased knowledge about mental illness may increase social distance towards people with mental illness in general (Lauber, Nordt, Falcato, & Rössler, 2004). A study on social distance among doctors in Nigeria also found that doctors indeed had high levels of social distance towards people with mental illness (Adewuya & Oguntade, 2007).

Nonetheless, in spite of the appropriate education and attitude, a health care provider's personal health choices also play a key role in client uptake of counselling interventions. A study done in the United Kingdom showed significant correlations between personal practices and counselling rates – among general practitioners – on topics ranging from alcohol, tobacco and substance use, to dietary fat intake and physical activity, among others. It has been shown that where the caregivers themselves are struggling with the same problem, it is difficult to counsel the patient (Oberg & Frank, 2009).

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study Design

The study employed a prospective study design. It was a before and after study, with web-based training as an intervention.

3.2 Study Site

The study was carried out at nine public primary healthcare facilities in Machakos and Makueni Counties, one private primary health care facility in Nairobi and one private facility in Machakos County, as seen in Figure 3.1.

3.3 Study population

The study population consisted of Primary Health Care workers namely; doctors, nurses, clinical officers and community health workers (community health workers for public facilities & data entry clerks or receptionists for private facilities) working at the selected study sites.

3.3.1 Inclusion criteria

1. Eligible respondents who gave consent to participate in the study.
2. Respondents who were within the targeted population i.e. physician, clinical officer, nurse, community health worker at the selected facilities.
3. Respondents aged 18 years and above.
4. Respondent having a minimum grade (standard) 8 level of proficiency in English.

3.3.2 Exclusion criteria

1. Eligible respondents who declined to give consent.
2. Staff that were expected to leave the facility before the end of the training period.

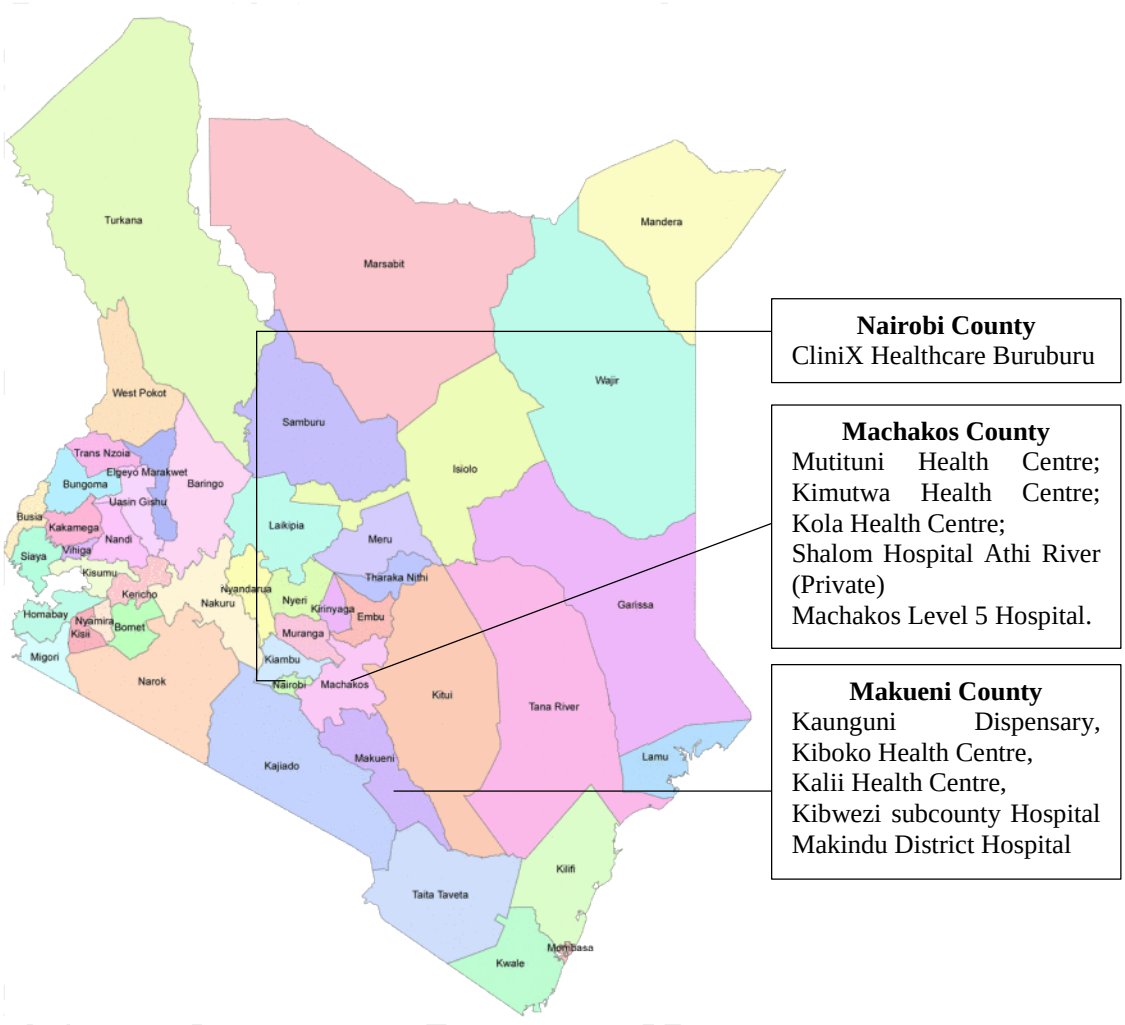

Figure 3.1: Geographical Spread of Study Sites on Map of Kenya

3.4 Sampling procedure

The selection criteria for the facilities was that they should already have been offering primary care services routinely and they should have been willing to participate in the training program, have had access to electricity, computer and telephone services, since the training was web-based. Sampling was accomplished purposively within the facilities themselves. In the smaller facilities and clinics all members of staff were invited to participate in the study. In the larger facilities, all those members of staff working in the out-patient departments were invited to participate in the study.

3.5 Sample size

The following formula for the comparison of means (Rosner, 2010) was used for sample size calculation:

$$n = \frac{2\{Z_{1-\alpha/2} + Z_{1-\beta}\}^2 \delta^2}{(\mu_1 - \mu_2)^2}$$

Where;

n= Minimum sample size;

α = Type I error / level of statistical significance (0.05);

β = Type II error (0.12);

$Z_{1-\alpha/2}$ = Standard normal deviate for α (1.96);

$Z_{1-\beta}$= Standard normal deviate for β (1.18);

δ = Estimated standard deviation from the mean stigma score for HCWs before intervention (7.9);

μ_1 = Estimated mean stigma score for HCWs before the web-based training (41.5);

μ_2 = Estimated mean stigma scores for HCWs after the web-based training (38.3).

$\mu_1 - \mu_2$ = Hypothesized mean difference (3.2).

The estimated mean stigma score for HCWs before intervention is assumed to be similar to that of the BC intervention on health care worker trial, which was 41.5 units at pre-test (Modgill & Patten, 2013). The hypothesized mean difference is 3.2. Using the formula and working with 80% power the minimum sample size required was 96.

3.6 Data management

3.6.1 Data Collection

The study data was collected using a modified version of the Opening Minds Scale for Health Care Providers (OMS-HC). This is a 20-item scale specifically developed and validated to measure mental illness-related stigma among health care providers (Kassam, Papish, Modgill, & Patten, 2012). The OMS-HC assessed Disclosure, Social Distance, Self-stigma (Help-seeking), Recovery, Social Responsibility and the role of healthcare workers as shown in Table 3.1. In each instance, the phrase "mental illness" was deleted and the phrases "alcohol use disorder" (AUD), "tobacco use disorder" (TUD) or "other substance use disorder" (SUD) was inserted; thereby repeating the survey three times -one for each category of AUD, TUD and SUD. Stigma towards people with AUD, SUD and TUD was assessed separately.

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) (Humeniuk, Ali, Poznyak, & Monteiro, 2010) was used to assess health worker substance use rates before the training. A KAP survey was used to elicit health worker knowledge and attitudes about alcohol, tobacco and substance use disorders; it included questions on self-efficacy with web-based training and practice confidence

in management of substance use disorders. This KAP survey has previously been used in Kenya (Ndetei, Khasakhala, Mutiso, & Mbwayo, 2011). A survey collecting demographic information was also included. The questionnaires were administered in English. All respondents were required to fill in the questionnaire. For the purposes of this study, the questionnaire was administered on 2 occasions – before (baseline) and after (post-intervention) the web based training. The post-intervention data was collected approximately three (3) months after the baseline data.

Table 3.1 Dimensions of Stigma by Survey Items of the Opening Minds Scale

Survey Item	Dimension of Stigma
1. I am more comfortable helping a person who has a physical illness than I am helping a person who has AUD/SUD/TUD.	Social distance
2. If a person with AUD/SUD/TUD complains of physical symptoms (e.g. nausea, back pain or headache), I would likely attribute this to their AUD/SUD/TUD.	Diagnostic overshadowing
3. If a colleague with whom I work told me they had a managed AUD/SUD/TUD, I would be as willing to work with him/her.	Social distance
4. If I were under treatment for AUD/SUD/TUD I would not disclose this to any of my colleagues.	Disclosure
5. I would be more inclined to seek help for AUD/SUD/TUD if my treating healthcare provider was not associated with my workplace.	Disclosure
6. I would see myself as weak if I had AUD/SUD/TUD and could not fix it myself.	Disclosure
7. I would be reluctant to seek help if I had AUD/SUD/TUD.	Disclosure
8. Employers should hire a person with a managed AUD/SUD/TUD if he/she is the best person for the job.	Recovery
9. I would still go to a physician if I knew that the physician had been treated for AUD/SUD/TUD.	Recovery
10. If I had AUD/SUD/TUD, I would tell my friends.	Disclosure
11. It is the responsibility of health care providers to inspire hope in people with AUD/SUD/TUD.	Social responsibility
12. Despite my professional beliefs, I have negative reactions towards people who have AUD/SUD/TUD.	Social responsibility
13. There is little I can do to help people with AUD/SUD/TUD.	Social responsibility
14. More than half of people with AUD/SUD/TUD don't try hard enough to get better.	Recovery
15. People with AUD/SUD/TUD seldom pose a risk to the public.	Dangerousness
16. The best treatment for AUD/SUD/TUD is medication.	Social distance
17. I would not want a person with AUD/SUD/TUD, even if it were appropriately managed, to work with children.	Social distance
18. Healthcare providers do not need to be advocates for people with AUD/SUD/TUD.	Social responsibility
19. I would not mind if a person with AUD/SUD/TUD lived next door to me.	Social distance
20. I struggle to feel compassion for a person with AUD/SUD/TUD.	Social responsibility

Note. Adapted from The development and psychometric properties of a new scale to measure mental illness related stigma by health care providers: The Opening Minds Scale for Health Care Providers (OMS-HC) by Kassam *et al.*, 2012, BMC Psychiatry.

3.6.2 The Study Intervention

In between the two data collection points the web-based training intervention was administered. A desktop computer and modem was provided in each of the participating facilities to ensure every trainee had access to a computer and internet. In the larger hospitals, two computers and modems have been provided.

The training was delivered online and covered the following major topics: screening, communication, and ethics, brief interventions using motivational interview techniques and scripts, primary care follow-up, referrals, and management of co-morbidities. In order to complete the training, each participant had to complete all the course readings, peer activities and mentored evaluations. A score of 60% in the final exam and practical evaluations was set as the pass mark.

3.6.3 Data analysis

Data analyses were done using IBM SPSS® version 23. The first stage in the analysis of all types of variables consisted of a scan of the data set to establish basic descriptive statistics that permitted a first approximation to the pattern of behaviour of each variable included in the dataset. This also helped to assess the relative effectiveness and success of the data cleaning and consistency controls already executed. In the case of discrete variables, frequency tables with single or multiple cross-classification criteria provided a good description of the variables. After the quality of the data collected had been documented and the general descriptions for the study variables had been obtained, the investigator proceeded with the statistical analysis of the whole dataset.

In the second level of analysis, the McNemar-Bowker Test of Symmetry was used to assess changes individual item by item responses from pre-test to post-test. The pre-test and post-test stigma scores were calculated by taking the sum of the 20 items in the scale; Items 3, 8, 9, 10, 11, 15 and 19 needed to be reverse scored (Kassam *et al.*, 2012). The mean difference in stigma score between the pre-test and the post-test was

estimated using the paired t-test. Sampling errors, measurements errors have been provided. The difference between final and baseline stigma scores was computed to come up with a variable of the differences. The difference was then correlated with various independent variables e.g. age, year of education, etc. to see which ones significantly correlate with the dependent variable (difference in stigma scores). To adjust for confounding, all independent variables that significantly correlated with the dependent variable at bi-variate analysis were considered together using multiple linear regressions. All tests were two-sided. A value of $p < .05$ was considered statistically significant.

3.7 Limitations

The use of the before and after evaluative approach in this study while more robust than observational studies, is not the gold standard for evaluative research (Grimshaw, Campbell, Eccles, & Steen, 2000). However, due to time and logistical constraints it was the most feasible approach.

Whereas, the study was sufficiently powered to detect a change in the overall scale scores, the sample size may not have been sufficient to provide a thorough analysis of individual survey item changes due to wide variability in the study population, which may feed into a difficulty in detecting statistically significant results due to large standard deviations for individual survey items.

3.8 Ethical considerations

In order to ensure that the study followed the principles of respect, beneficence and justice and in order to protect and prevent unnecessary risk to respondents, the protocol was reviewed and approved by the CPHR Scientific Committee, KEMRI SSC and KEMRI ERC. The appropriate ethical and consent forms are attached in the appendices. The approval letters were used to approach the relevant stakeholders e.g. the District Health Management Team (DHMT) and facility heads to explain the intentions of the study.

CHAPTER FOUR

RESULTS

4.1 Response Rate

The study targeted a minimum of 96 healthcare workers, but a total of 166 were invited. By the end of the study 102 HCWs had completed the pre-test questionnaire, the training intervention and the post-test questionnaire, resulting in a response rate of 61.4% based on the number of participants invited. This figure, nonetheless, was still higher than the minimum sample size required to test the hypothesis.

Table 4.1: Enrolment and Completion Rates by Study Site

	Study Site	Enrolled (n)	Completed (n)	% Completion
1	CliniX Healthcare Buruburu	10	8	80%
2	Kibwezi sub County Hospital	27	15	55.6%
3	Makindu sub County Hospital	33	19	57.6%
4	Kaunguni Dispensary	4	4	100%
5	Kalii Health Centre	5	5	100%
6	Kiboko Health Centre	4	4	100%
7	Mutituni Health Centre	16	12	75%
8	Machakos Level 5 Hospital	30	13	43.3%
9	Kola Health Centre	11	9	81.8%
10	Kimutwa Dispensary	6	3	50%
11	Shalom Hospital Athi River	20	10	50%
	TOTAL	**166**	**102**	**61.4%**

4.2 Reliability Analysis

Cronbach's alpha was used to assess the internal consistency of the Opening Minds Scale for Healthcare workers (OMS-HC). Stigma was measured separately for Alcohol Use Disorders (AUD), Substance Use Disorders (SUD) and Tobacco Use Disorders (TUD); hence there are three sets of reliability values. The findings indicated that OMS-HC scales rated well above acceptable levels for both pre-test and post-test. The summary of reliability analysis is shown in Table 4.2.

Table 4.2: Reliability Analysis of Opening Minds Scale Survey

Scale	Pre-test	Comments	Post-test	Comments
OMS HC AUD	.625	Acceptable	.818	Good
OMS HC SUD	.623	Acceptable	.810	Good
OMS HC TUD	.637	Acceptable	.806	Good

Note. OMS HC=Opening Minds Scale for Healthcare Workers; AUD =Alcohol Use Disorders; SUD=Substance Use Disorders; TUD=Tobacco Use Disorders

4.3 Socio-demographic Characteristics of Study Respondents

Based on their areas of specialization, respondents were categorized into two major groups for the training i.e. Clinicians or Primary Healthcare Workers (PHC) - Doctors, Nurses and Clinical Officers; and Non-clinicians or Community health Workers (CHW) - all other categories of staff with the exception of the three mentioned above. In total, there were 93 PHC and 113 CHW trainees enrolled for the online training.

Majority (57.8%) of the respondents were female and 42.2% of them were male. The ages of the respondents ranged from 20 to 58 years. The Mean age was 35.9 (*SD*=10.6) years. Those aged 25 to 30 years were the most populous in the sample (34.0%), followed by those aged 31 to 35 years at 14.4%. All respondents were educated to secondary school level and beyond. Certificate holders formed almost half the total number of respondents. The data further indicated these qualifications were attained between the year 1976 and 2014, with the 2000 as the mean year.

The largest portion of respondents (99.0%) indicated that they were Christians, and Muslims (1.0%). Despite all respondents indicating religious affiliation, only 45.8% attend all religious services in a month. A greater proportion (87.6%) of the respondents indicated that they had a regular source of income. However, 73% of respondents indicated that they ran businesses on the side to augment their income. Only 9.8% of respondents reported not owning Mobile Phone, while at the other end of the spectrum, only 6.9% of respondents reported owning a Motor Vehicle. Most (61.8%) of the respondents indicated that they were married. A large part (32.4%) of

the remainder indicated that they were single. Regarding their experience with computers, two-thirds of respondents (66.1%) reported that they had only used computers for 3 years or less.

Table 4.3: Socio-demographic Characteristics of Respondents by Cadre

Characteristic		PHC[a] % (N=40)	CHW[b] % (N=62)	TOTAL % (N = 102)
Age group	Below 25 years	2 (5.1%)	7 (12.1%)	9 (9.3%)
	25 to 30 years	14 (35.9%)	19 (32.8%)	33 (34.0%)
	30 to 35 years	6 (15.4%)	8 (13.8%)	14 (14.4%)
	36 to 40 years	4 (10.3%)	8 (13.8%)	12 (12.4%)
	41 to 45 years	7 (17.9%)	5 (8.6%)	12 (12.4%)
	46 to 50 years	2 (5.1%)	3 (5.2%)	5 (5.2%)
	Above 50 years	4 (10.3%)	8 (13.8%)	12 (12.4%)
Gender	Male	13 (32.5%)	30 (48.4%)	43 (42.2%)
	Female	27 (67.5%)	32 (51.6%)	59 (57.8%)
Education Level	Secondary	0	15 (25.9%)	15 (15.5%)
	Certificate	12 (30.8%)	33 (56.9%)	45 (46.4%)
	Diploma	15 (38.5%)	5 (8.6%)	20 (20.6%)
	Degree	12 (30.8%)	5 (8.6%)	17 (17.5%)
Religious Affiliation	Christian	40 (100%)	61 (98.4%)	101 (99.0%)
	Muslim	0	1 (1.6%)	1 (1.0%)
Religious Attendance	Never	2 (5.3%)	2 (3.4%)	4 (4.2%)
	Once a month	5 (13.2%)	8 (13.8%)	13 (13.5%)
	Twice a month	4 (10.5%)	8 (13.8%)	12 (12.5%)
	Thrice a month	10 (26.3%)	13 (22.4%)	23 (24.0%)
	Hardly ever miss	17 (44.7%)	27 (46.6%)	44 (45.8%)
Owns (indicator of socio-economic status)	Mobile Phone	38 (95.0%)	54 (87.1%)	92 (90.2%)
	Computer	11 (28.2%)	17 (29.3%)	28 (28.9%)
	Modem	12 (31.6%)	9 (16.4%)	21 (22.6%)
	Bicycle	7 (17.5%)	9 (16.1%)	16 (16.7%)
	Motorcycle	7 (17.5%)	6 (1.8%)	13 (13.7%)
	Motor vehicle	5 (12.8%)	2 (3.7%)	7 (6.9%)
Marital Status	Single	9 (22.5%)	24 (38.7%)	33 (32.4%)
	Co-habiting	0	1 (1.6%)	1 (1.0%)
	Married	29 (72.5%)	34 (54.8%)	63 (61.8%)
	Divorced/Separated	1 (2.5%)	2 (3.2%)	3 (2.9%)
	Widow/ Widower	1 (2.5%)	1 (1.6%)	2 (2.0%)
Computer Use	Less than 3 months	4 (13.8%)	9 (21.4%)	13 (18.3%)
	3 months to 1 year	8 (27.6%)	12 (28.6%)	20 (28.2%0
	1 year to 3 years	7 (24.1%)	7 (16.7%)	14 (19.7%)
	4 years to 5 years	3 (10.3%)	3 (7.1%)	6 (8.5%)
	More than 6 years	7 (24.1%)	11 (26.2%)	18 (25.4%)

[a]PHC= Primary Healthcare Worker; [b]CHW= Community Health Worker

4.4 Comparison between Pre-test and Post-test Stigma Scores

The comparison between the mean pre-test and post-test stigma scores is shown in Table 4.4. There were statistically significant reductions in healthcare worker stigma towards people with AUD (p=0.006), SUD (p=0.001) and TUD (p=0.011), after the web-based training intervention.

Table 4.4: Comparison of Pre-test and Post-test Stigma Scores

Scale	Pre-test Mean (95% CI)	Post-test Mean (95% CI)	Mean Difference (95% CI	p-value
AUD	52.37 (50.73 – 54.01)	49.46 (47.48 – 51.44)	2.91 (0.85 - 4.97)	0.006
SUD	52.40 (50.77 – 54.04)	49.36 (47.39 – 51.34)	3.04 (0.98 - 5.10)	0.001
TUD	52.36 (50.76 – 53.97)	49.65 (47.67 – 51.62)	2.71 (0.62 - 4.81)	0.011

$^{*}p < 0.05$; $^{**}p < 0.01$ *Note.* CI= Confidence Interval; AUD= Alcohol Use Disorders; SUD= Substance Use Disorders; TUD= Tobacco Use Disorders

4.5 Change in Dimensions of Stigma from Pre-test to Post-test

4.5.1 Change in Dimension of Social Distance from Pre-test to Post-test

4.5.1.1 Level of Comfort in Helping People with AUD, SUD or TUD

Respondents were asked whether they are more comfortable helping a person with physical illness than one with AUD, SUD or TUD. The proportion of respondents indicating stigmatizing attitudes reduced from pre-test to post-test for AUD (45% to 24%), SUD (45.5% to 23.2%) and TUD (47.9% to 22%). The proportion of respondents indicating unsure answers increased from pre-test to post-test for AUD (10% to 22%), SUD (10.1% to 20.2%) and TUD (10.4% to 15.5%). An increase in the proportion of respondents indicating non-stigmatizing answers from pre-test to post-test was also seen for AUD (45% to 54.0%), SUD (44.4% to 56.6%) and TUD (41.7% to 43.3%) (Figure 4.1). Results from the McNemar-Bowker Test of Symmetry indicate that the reduction in social distance in this survey item was statistically significant for AUD ($p = 0.001$), SUD ($p = 0.001$) and TUD ($p < 0.001$).

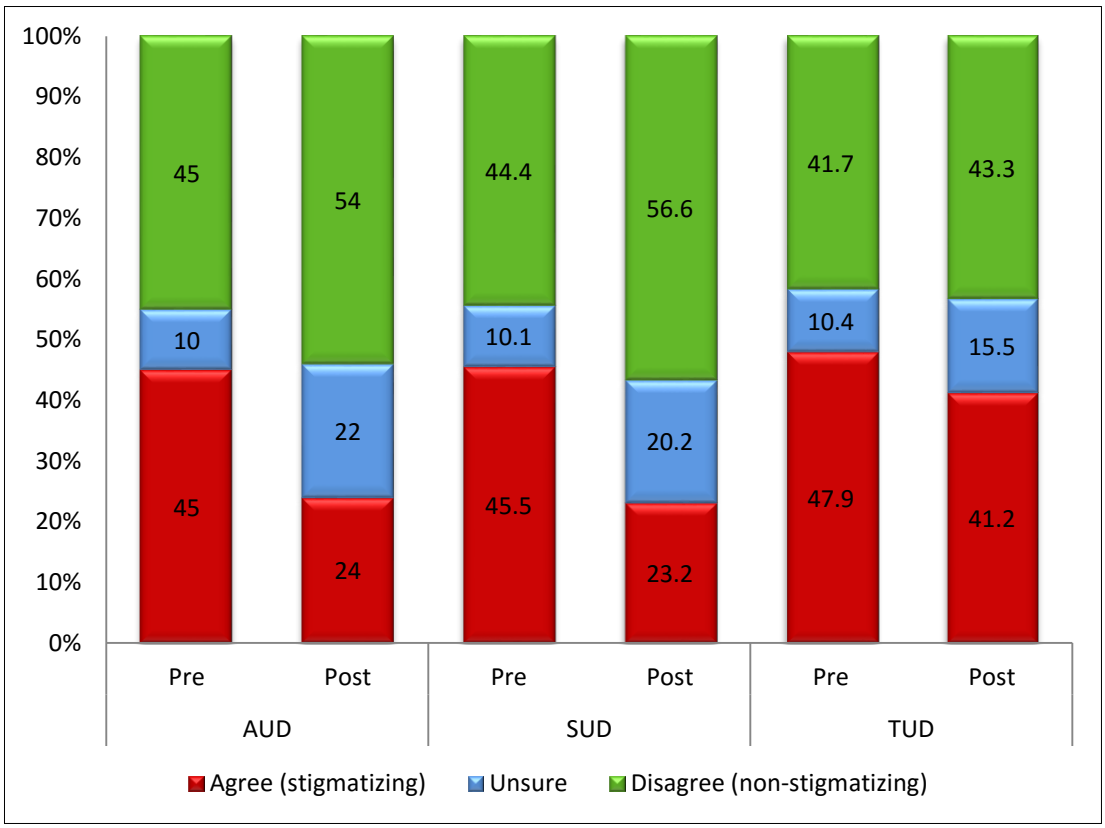

Figure 4.1: I am more comfortable helping a person who has a physical illness than I am helping a person who has AUD/SUD/TUD

4.5.1.2 Willingness to Work with someone who has AUD, SUD or TUD

Only 7.1%, 8.1% and 7.2% of respondents indicated any stigma to this survey item for AUD, SUD and TUD respectively, at pre-test. These proportions increased to 9%, 9.1% and 9.3% at post-test. The proportions of those indicating that they were unsure reduced slightly from 8.1% to 5.1% (AUD), 7.1% to 4.0% (SUD) and 7.2% to 3.1% (TUD). There were also increases seen in the proportions of those indicating non-stigmatizing attitudes respectively as shown in the Figure 4.2. Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD ($p = .543$), SUD ($p = .519$) and TUD ($p = .392$).

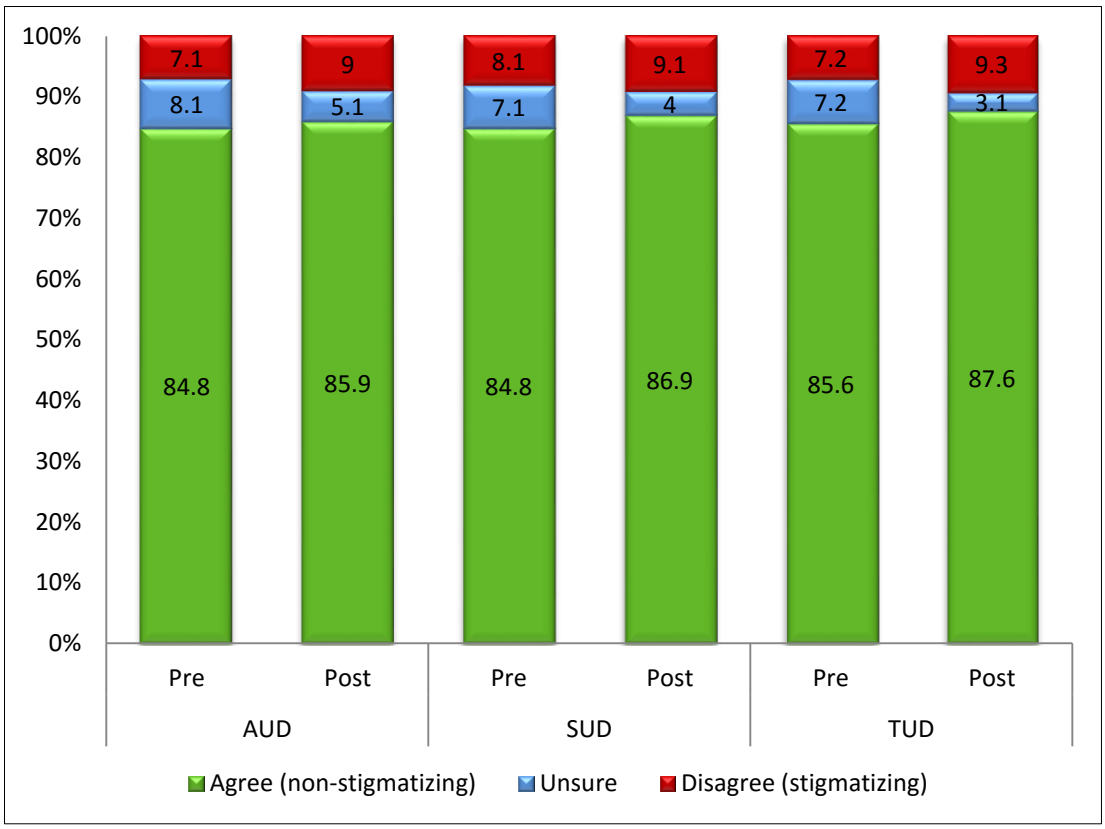

Figure 4.2: If a colleague with whom I work told me they had a managed AUD/SUD/TUD, I would be just as willing to work with him/her.

4.5.1.3 Medication is the Best Treatment for AUD, SUD or TUD

After the training there was an increased proportion of respondents who believed that the best treatment for AUD and SUD is medication compared to the pre-test. The proportion who believed that the best treatment for AUD and SUD is medication was 20.6% and 20.2%, after training compared to 17.5% and 17%. The proportions for TUD remained unchanged at 20%. There was a reduction in non-stigmatizing attitudes from 71.2% to 65% for AUD, 71.3% to 66% for SUD and 68.9% to 64.4% for TUD. Additionally, the post-test showed that an increased proportion of respondents indicated that they were unsure after the training (Figure 4.3). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD ($p = .761$), SUD ($p = .757$) and TUD ($p = .667$).

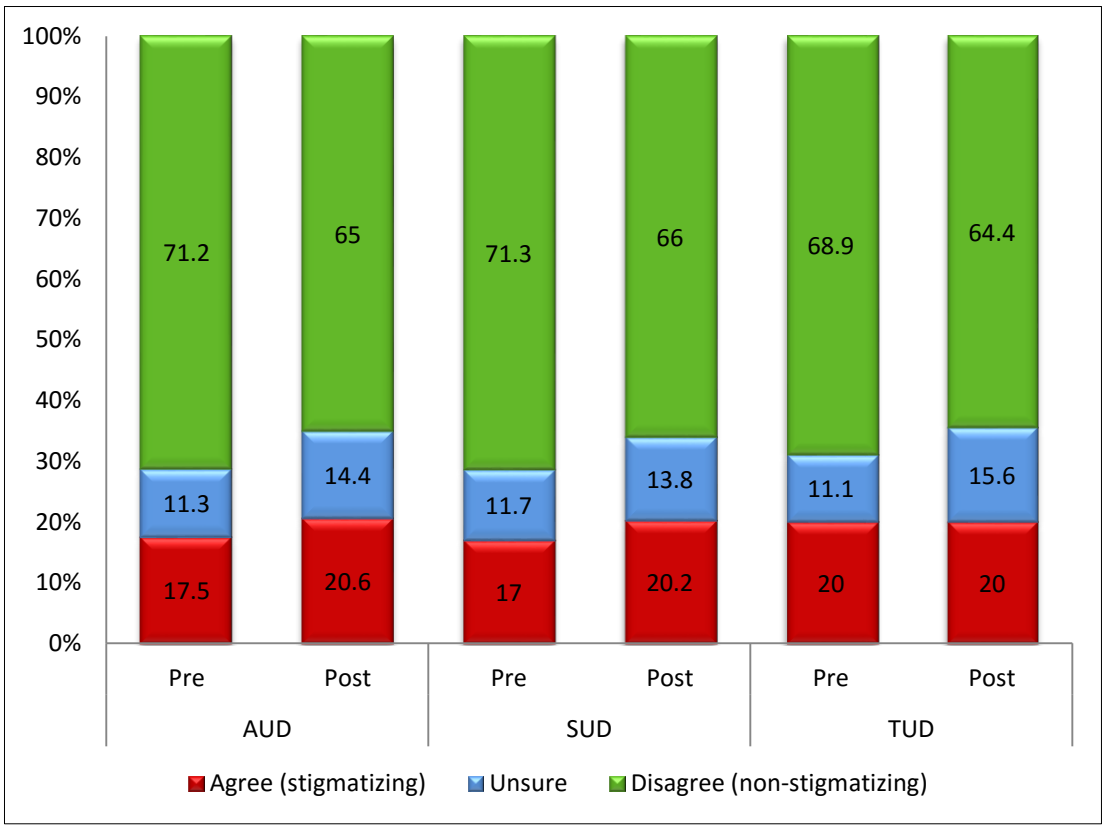

Figure 4.3: The best treatment for AUD/SUD/TUD is medication.

4.5.1.4 Living close to someone with AUD, SUD or TUD

At pre-test, 44.3%, 45.3% and 48.9% of respondents indicated that they wouldn't want to live next door to people with AUD, SUD or TUD. There were reductions in the proportion of respondents who held this view to 36.1%, 33.7% and 37% for AUD, SUD and TUD respectively. The proportion of respondents who indicated unsure responses reduced for AUD (20.6% to 14.4%), SUD (20% to 14.7%) and TUD (17.4% to 16.3%). There were increases in the proportions of respondents who held non-stigmatizing attitudes from 35.1% to 49.5% (AUD), 34.7% to 51.6% (SUD) and 33.7% to 46.7% (TUD) (Figure 4.4). Results from the McNemar-Bowker Test of Symmetry indicate that the reduction in social distance was statistically significant for SUD ($p = 0.031$) and not significant for AUD ($p = 0.061$) and TUD ($p = 0.146$).

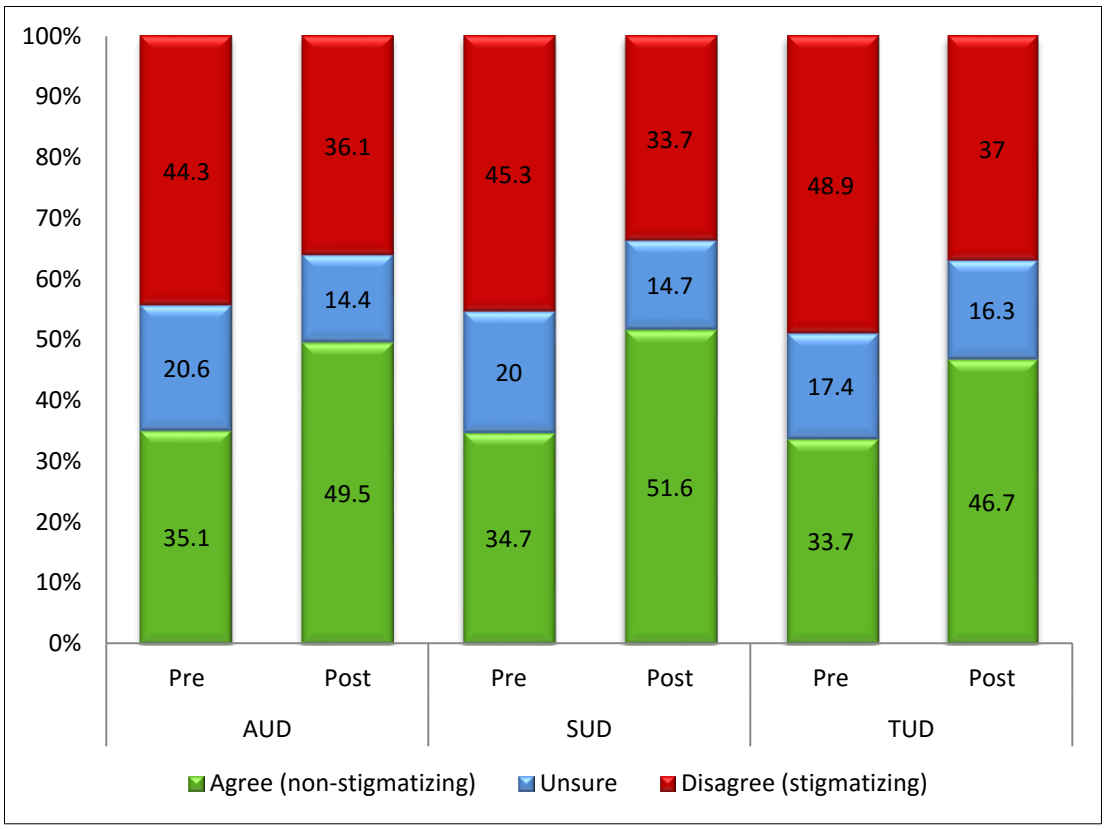

Figure 4.4: I would not mind if a person with AUD/SUD/TUD lived next door to me.

4.5.1.5 Someone with AUD, SUD or TUD working with Children

Survey Item 17 stated "I would not want a person with AUD/SUD/TUD, even if it were appropriately managed, to work with children." The proportion of stigmatizing attitudes increased from 23.2% to 27.3% for AUD and 23.7% to 27.8% for SUD with a reduction of 31.2% to 29% for TUD. There were slight reductions in the proportions of respondents holding unsure responses i.e. 13.1% to 11.1% for AUD, 14.4% to 10.3% for SUD and 12.9% to 10.8% for TUD. Proportions for non-stigmatizing attitudes reduced for AUD (63.7% to 61.6%) flat lined for SUD (61.9%) while those for TUD increased (55.9% to 60.2%) (Figure 4.5). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were statistically significant for SUD ($p = 0.049$), and not significant for AUD ($p = 0.342$) and TUD ($p = 0.343$).

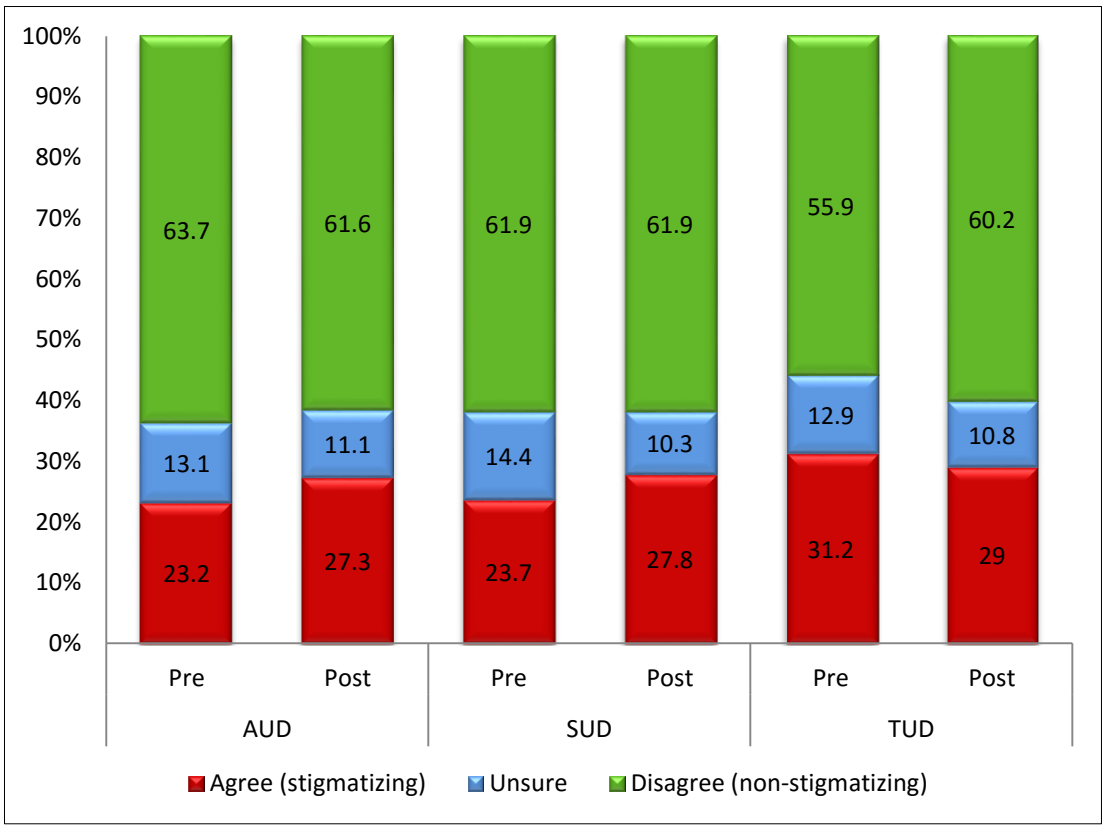

Figure 4.5: I would not want a person with AUD/SUD/TUD, even if it were appropriately managed, to work with children.

4.5.2 Change in Dimension of Diagnostic Overshadowing from Pre-test to Post-test

4.5.2.1 Primary Cause of Disease in People with AUD, SUD or TUD

More than one third (41.7%) of pre-test respondents believed that in a person with AUD, physical symptoms e.g. nausea, back pain or headache would likely be due to the AUD itself. This belief was shared by 40.6% of respondents at post-test. For SUD the proportion was 42.3% at pre-test and 41.2% at post-test. For TUD, there was a numerically larger decline from 45.9% to 39.6%, as shown below. There was a decrease in the proportion of individuals holding non-stigmatizing attitudes from 47.9% to 43.8% (AUD), 47.4% to 43.3% (SUD) and 45.8% to 42.7% (TUD) and an increase in the proportion who indicated that they were unsure from 10.4% to 15.6% (AUD), 10.3% to 15.5% (SUD) and 8.3% to 17.7% (TUD) (Figure 4.6). Results from

the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD (p = .579), SUD (p = .412) and TUD (p = .348).

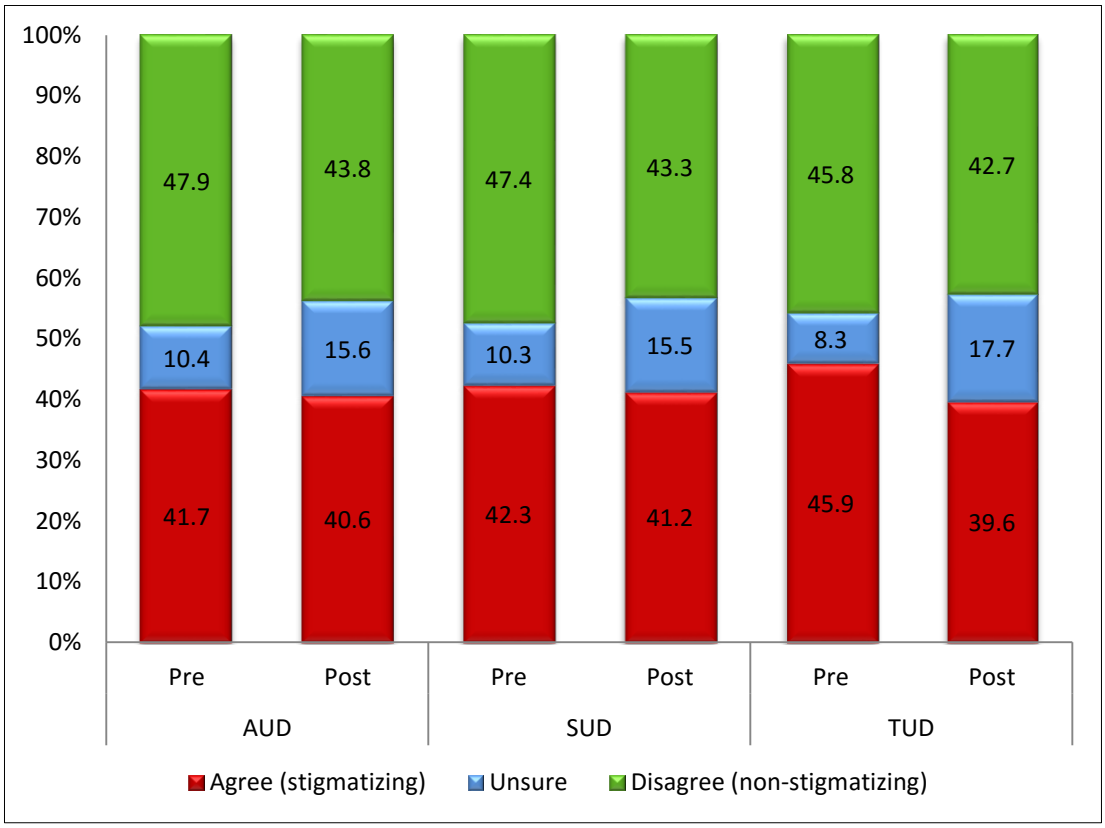

Figure 4.6: If a person with AUD/SUD/TUD complains of physical symptoms (e.g., nausea, back pain or headache), I would likely attribute this to their AUD/SUD/TUD.

4.5.3 Change in Dimension of Disclosure from Pre-test to Post-test

4.5.3.1 Disclosure of AUD, SUD or TUD treatment to colleagues

Slightly above 20% of respondents indicated that they would not disclose their treatment for AUD, SUD or TUD to colleagues. Proportions for this item were - for the most part - unchanged even after the web-based training (Figure 4.7). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD (p = .808), SUD (p = .615) and TUD (p = .650).

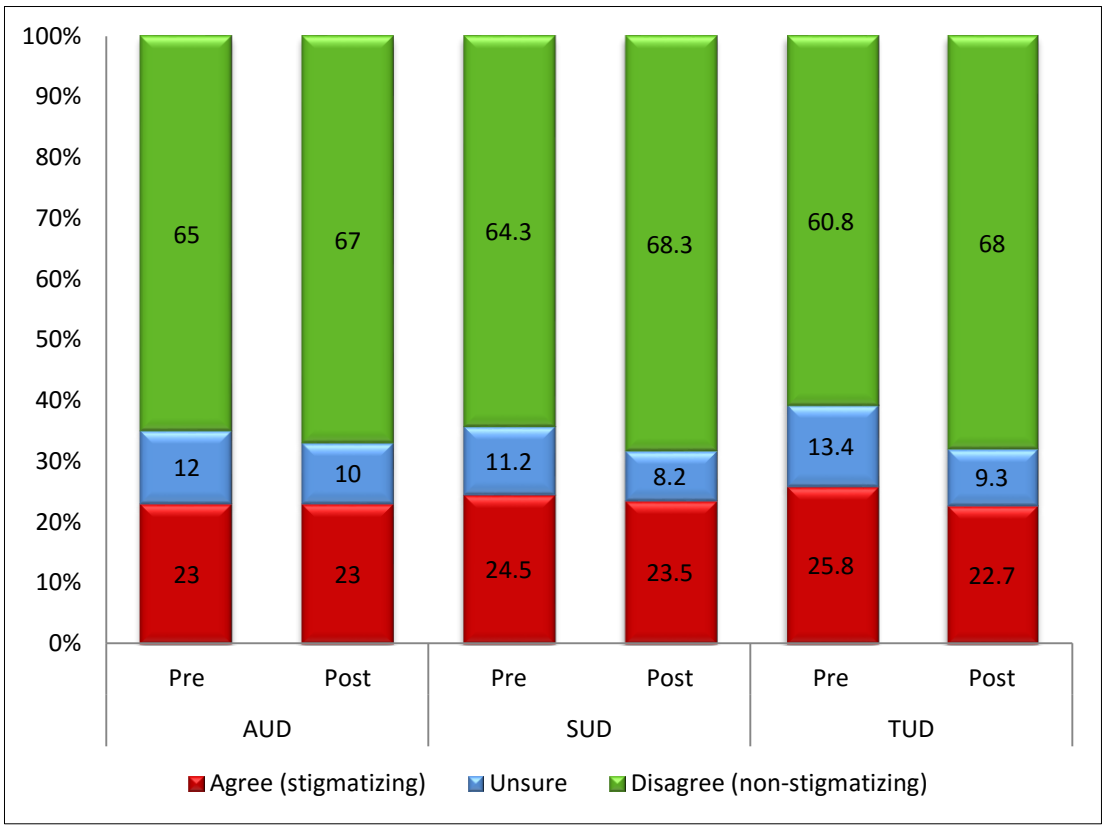

Figure 4.7: If I were under treatment for AUD/SUD/TUD I would not disclose this to any of my colleagues.

4.5.3.2 Help seeking for own AUD, SUD or TUD

At pre-test, 55.1%, 55.7% and 57.4% of respondents indicated that they would be more inclined to seek help for AUD, SUD or TUD respectively, if their healthcare provider was not associated with their workplace. The proportion of respondents who still held this view at post-test were 43.9%, 43.3% and 44.7% for AUD, SUD and TUD respectively. This decline in stigmatizing fed into an increase - from pre-test to post-test - in the proportion of both unsure and non-stigmatizing responses across the board (Figure 4.8). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were statistically significant for AUD ($p = .303$), SUD ($p = .226$) and TUD ($p = .223$).

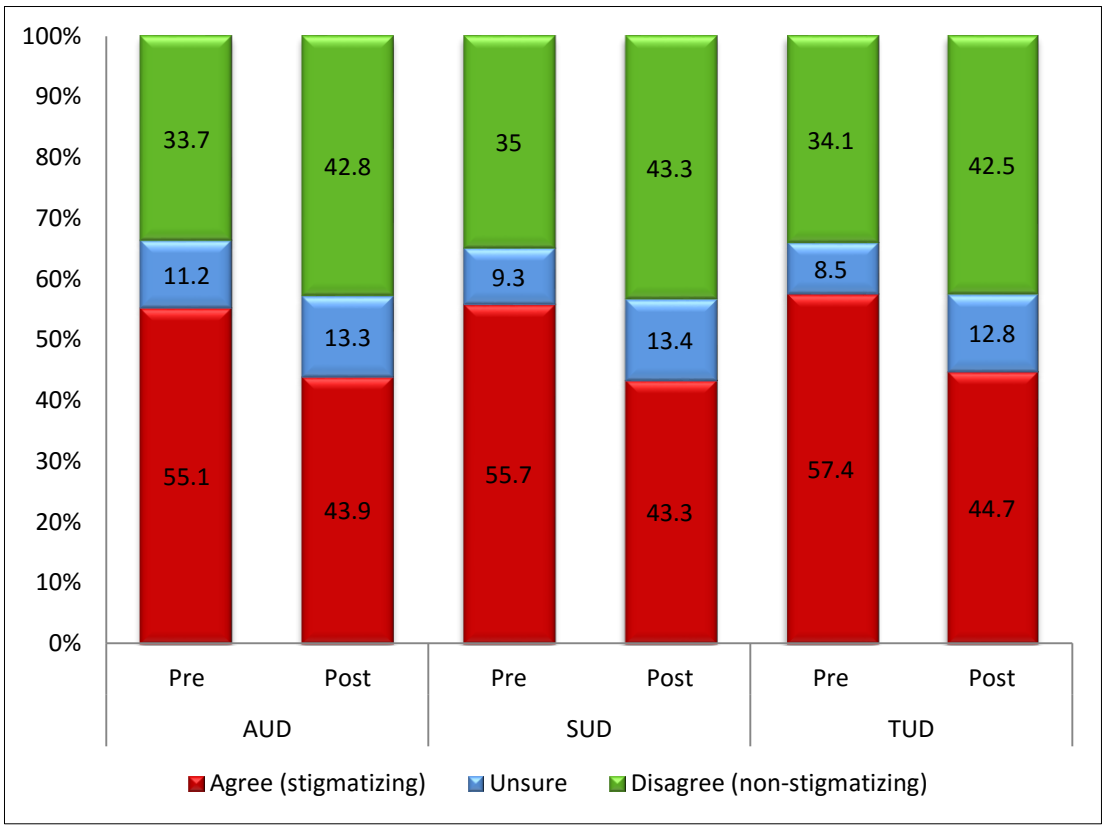

Figure 4.8: I would be more inclined to seek help for AUD/SUD/TUD if my treating healthcare provider was not associated with my workplace.

4.5.3.3 Willingness to seek help for own AUD, SUD or TUD

Respondents indicated that they would not be reluctant to seek help for AUD, SUD and TUD, with 67.4%, 68.4% and 68.8% respectively at pre-test, increasing to 77.5%, 77.5% and 77.1% respectively at post-test. While the proportions of those indicating stigmatizing attitudes remained largely unchanged at post-test, there was a decline in the proportion of individuals indicating that they were unsure from 11.2% to 3.1% for AUD, 10.2% to 3.1% for SUD and 8.3% to 2.1% for TUD (Figure 4.9). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD ($p = .135$), SUD ($p = .197$) and TUD ($p = .230$).

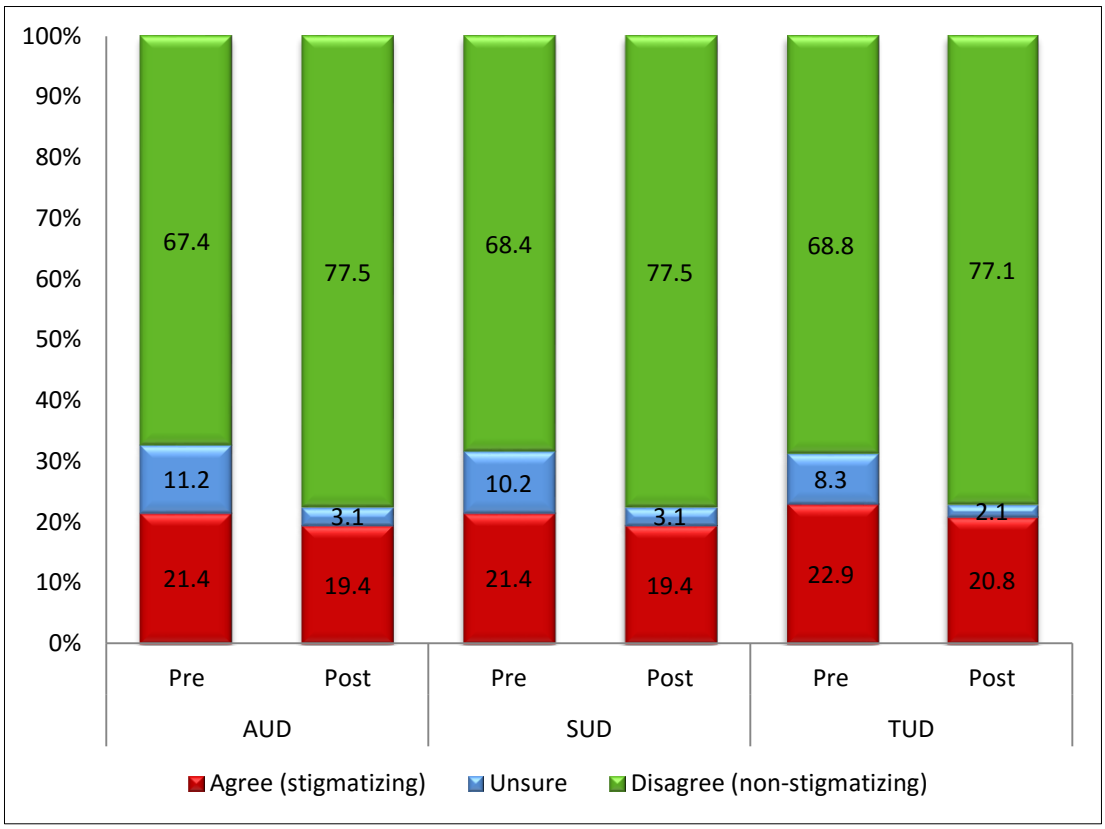

Figure 4.9: I would be reluctant to seek help if I had AUD/SUD/TUD.

4.5.3.4 Disclosure of personal AUD, SUD or TUD to friends

At pre-test, slightly above 60% percent of respondents indicated that they would disclose their own AUD, SUD or TUD to friends. After the training, at least 70% of them indicated they would disclose any of the three conditions to friends with a higher proportion saying they would disclose AUD and SUD than TUD. Slight reductions were seen at post-test over pre-test, in the proportion of people who indicated that they were unsure (Figure 4.10). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD (p = .06), SUD (p = .087) and TUD (p = .376).

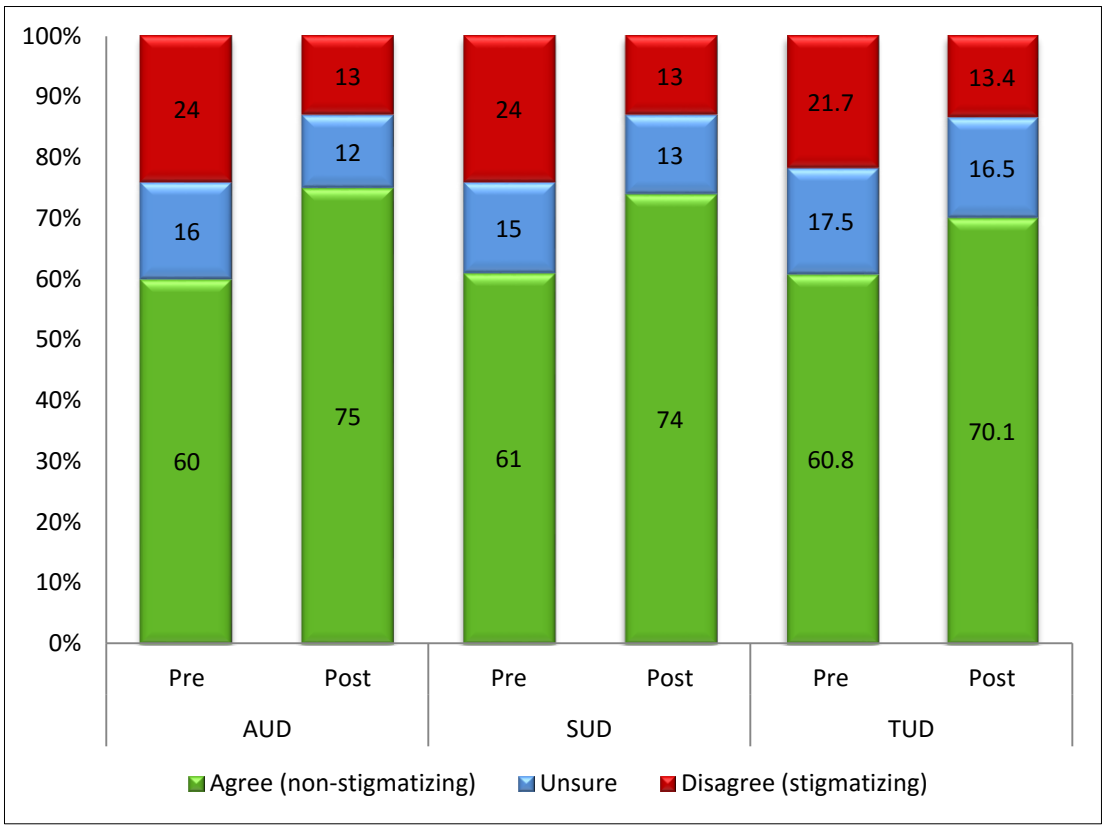

Figure 4.10: If I had AUD/SUD/TUD, I would tell my friends.

4.5.4 Change in Dimension of Self-stigma from Pre-test to Post-test

4.5.4.1 Self-stigma for AUD, SUD or TUD

During the pre-training evaluation 36.4%, 38.1% and 40% of respondents indicated self-stigma for AUD, SUD and TUD. This proportion changed marginally for AUD to 35.4% at post-test. There were reductions of higher magnitude for SUD and TUD to 34% and 34.7% respectively. The proportion of individuals who indicated that they were unsure reduced at post-test across the (Figure 4.11). Results from the McNemar-Bowker Test of Symmetry indicate that the reductions in self-stigma were statistically significant for AUD ($p = 0.016$), SUD ($p = 0.046$) and TUD ($p = 0.011$).

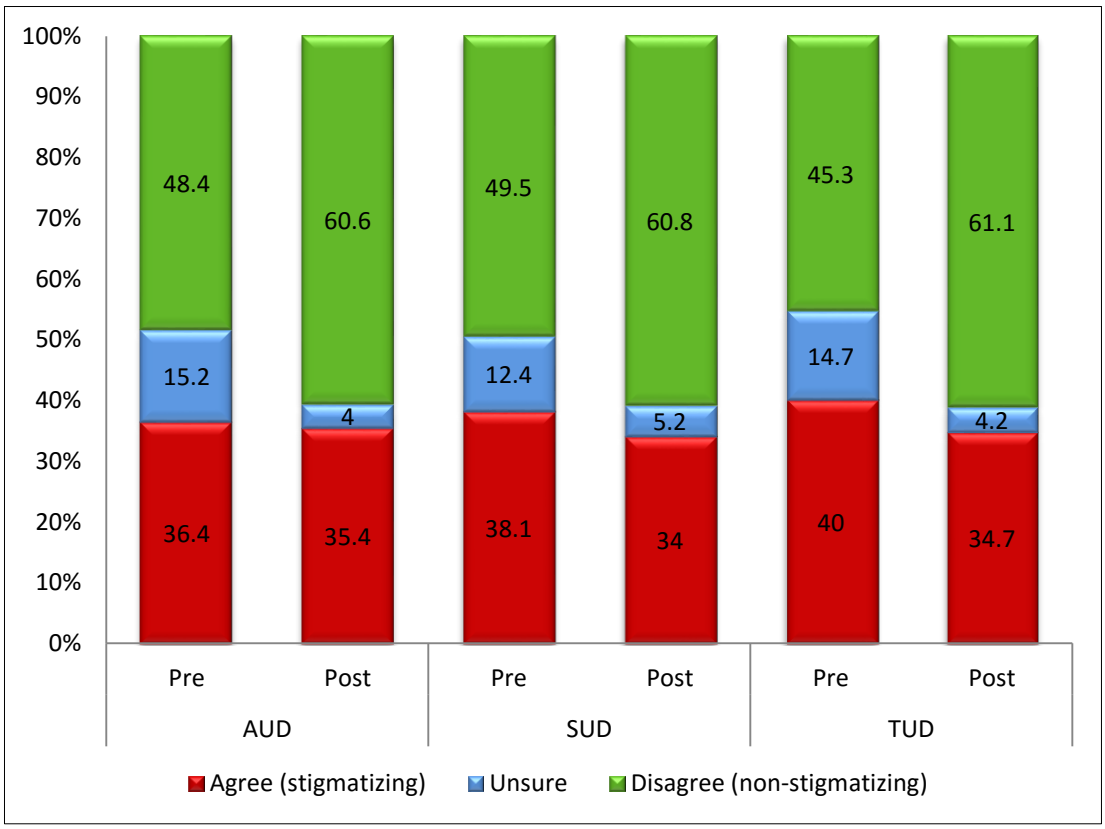

Figure 4.11: I would see myself as weak if I had AUD/SUD/TUD and could not fix it myself.

4.5.5 Change in Dimension of Recovery from Pre-test to Post-test

4.5.5.1 Employment of People in Recovery from AUD, SUD or TUD

At pre-test, 78%, 78% and 82.5% of respondents believed that a person in recovery for AUD, SUD or TUD should be hired if they were the best person for the job at pre-test with surprising decreases to 74%, 75% and 73.2%, respectively. This coincided with an increase in the proportion of respondents holding stigmatizing attitudes from pre-test to post-test i.e. 12% to 20% for AUD, 13% to 18% for SUD and 11.3% to 19.6% for TUD (Figure 4.12). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD (p = .406), SUD (p = .715) and TUD (p = .425).

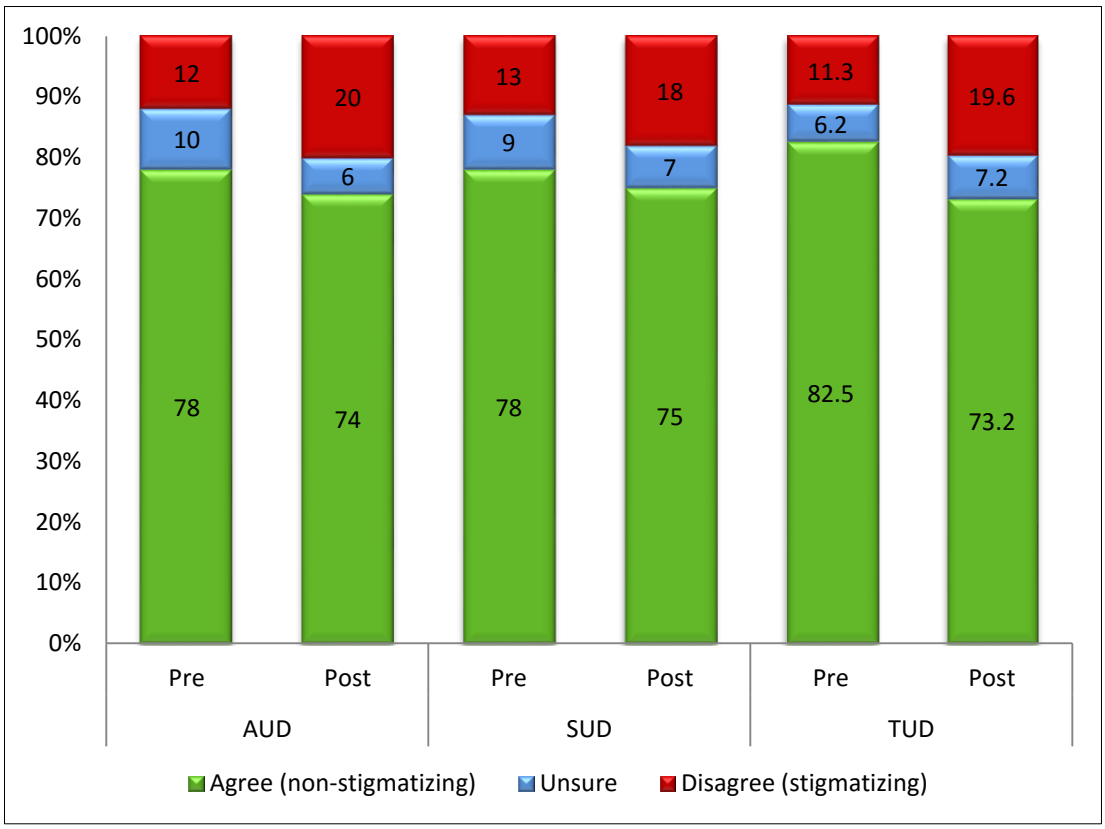

Figure 4.12: Employers should hire a person with a managed AUD/SUD/TUD if he/she is the best person for the job.

4.5.5.2 Recovery of People with AUD, SUD or TUD

At pre-test, 63.9%, 62.1% and 63.7% of respondents believed that more than half the people with AUD, SUD or TUD don't try hard enough to get better. After the training, the proportion who still held this belief fell by approximately10% for AUD, SUD and TUD. At the same time there were increases in proportions at post-test for those indicating non-stigmatizing and unsure responses (Figure 4.13). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD (p = .063), SUD (p = .073) and TUD (p = .099).

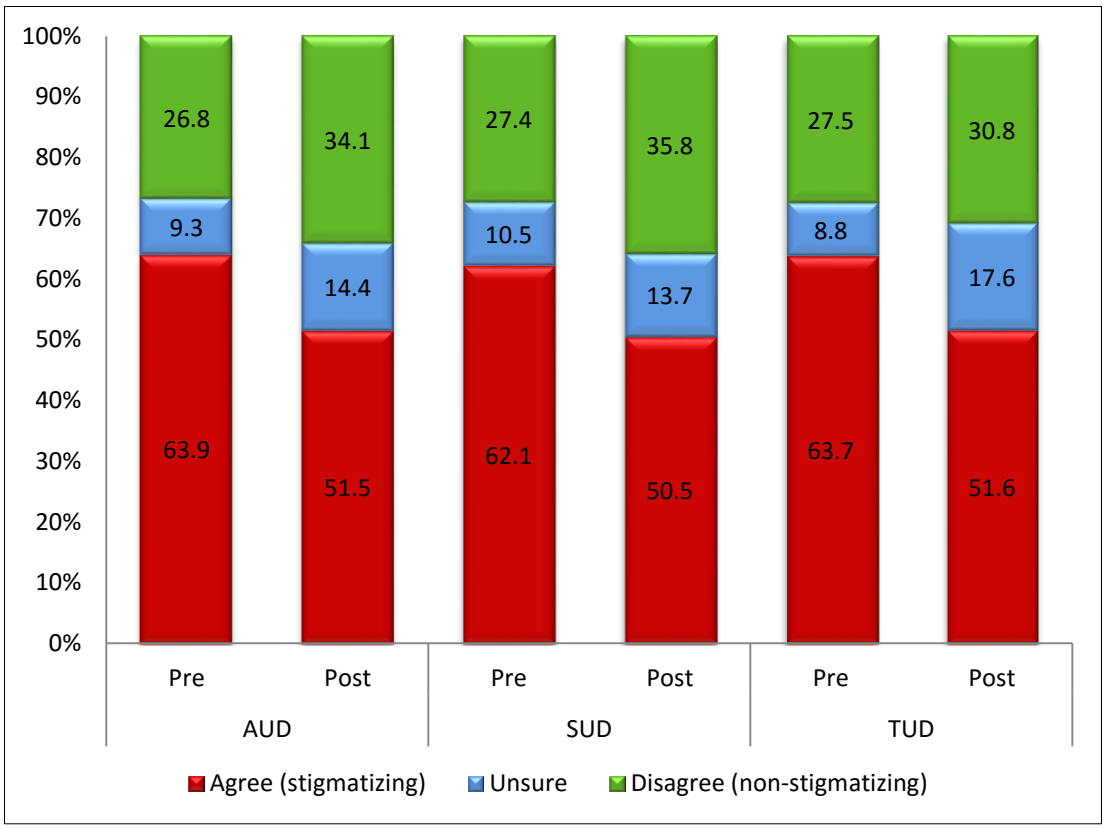

Figure 4.13: More than half of people with AUD/SUD/TUD don't try hard enough to get better.

4.5.5.3 Likelihood of visiting a physician in Recovery from AUD, SUD or TUD

Over three quarters of respondents (77.6%, 79.8% and 80.2%) indicated that they would still see a physician in recovery for AUD, SUD or TUD respectively, with this proportions increasing slightly at post-test to 81.6% and 80.8% for AUD and SUD but reducing slightly to 79.2% for TUD. Interestingly, the proportion of those holding stigmatizing attitudes increased at post-test from 7.1% to 14.3% for AUD, 8.1% to 15.2% for SUD and 9.4% to 14.5% for TUD. The proportions of those who indicated that they were unsure decreased at the post-test and may have fed the increase in those holding stigmatizing attitudes (Figure 4.14). Results from the McNemar-Bowker Test of Symmetry indicate that the increase in stigmatizing attitudes was statistically significant for AUD only (p = 0.03) and not statistically significant for SUD (p = 0.083) and TUD (p = 0.403).

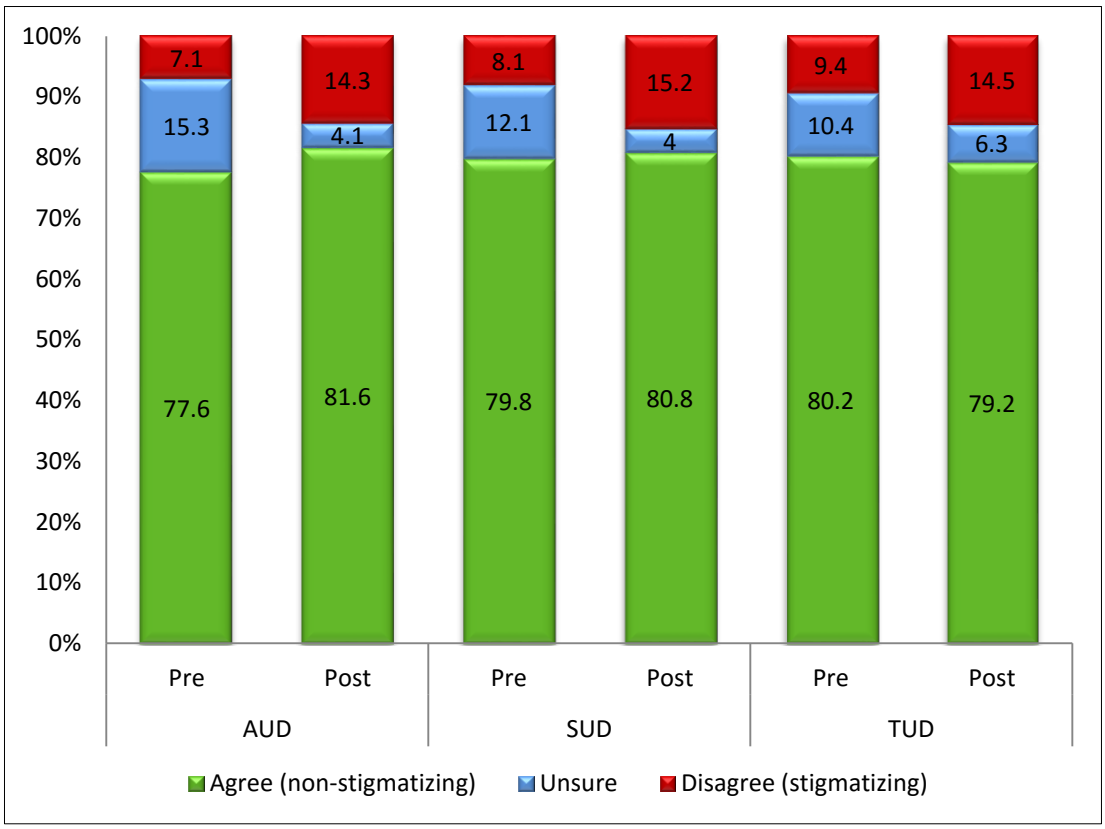

Figure 4.14: I would still go to a physician if I knew that the physician had been treated for AUD/SUD/TUD.

4.5.6 Change in Dimension of Dangerousness from Pre-test to Post-test

4.5.6.1 Dangerousness of People with AUD, SUD or TUD

Before the training, 36.4%, 39.5% and 40.2% of respondents indicated that people with AUD, SUD and TUD do indeed pose a risk to the public. After the training there was a reduction in the proportion of respondents holding stigmatizing attitudes to 32.4%, 32.3% and 29.7% for AUD, SUD and TUD, respectively. There were increases in the proportions of respondents who indicated they were unsure or held non-stigmatizing attitudes at post-test over pre-test (Figure 4.15). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD (p = .675), SUD (p = .260) and TUD (p = .379).

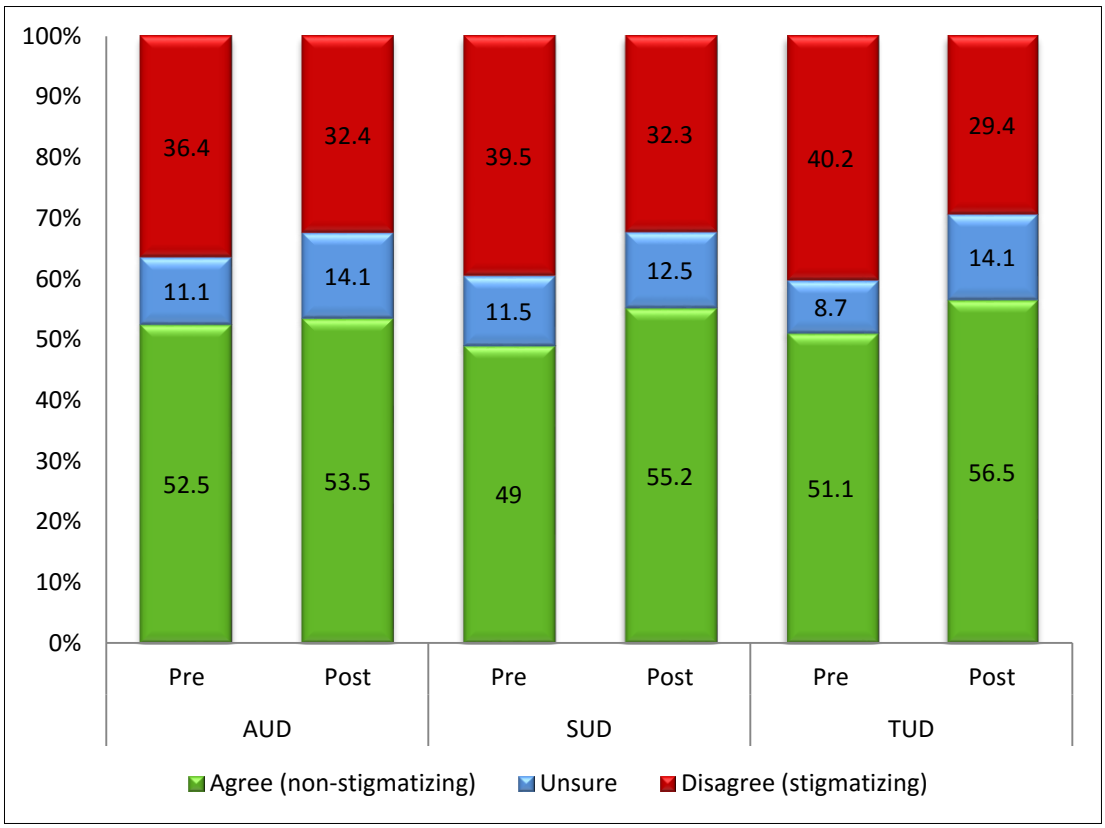

Figure 4.15: People with AUD/SUD/TUD seldom pose a risk to the public.

4.5.7 Change in Dimension of Social Responsibility from Pre-test to Post-test

4.5.7.1 Compassion for people with AUD, SUD or TUD

Prior to the training, 48%, 51.1% and 53.8% of respondents indicated that they struggle to feel compassion for people with AUD, SUD and TUD respectively. After the training 34.7%, 34% and 34.4% still indicated a stigmatizing attitude on this item for AUD, SUD and TUD respectively, which is a reduction compared to the pre-test. There was a corresponding increase in non-stigmatizing attitudes and while unsure responses were – for the most part – unchanged for AUD and SUD, while those for TUD increased by 4.3% (Figure 4.16). Results from the McNemar-Bowker Test of Symmetry indicate that the increase in social responsibility was statistically significant for SUD ($p = 0.043$) and TUD ($p = 0.037$) and not significant for AUD ($p = 0.153$).

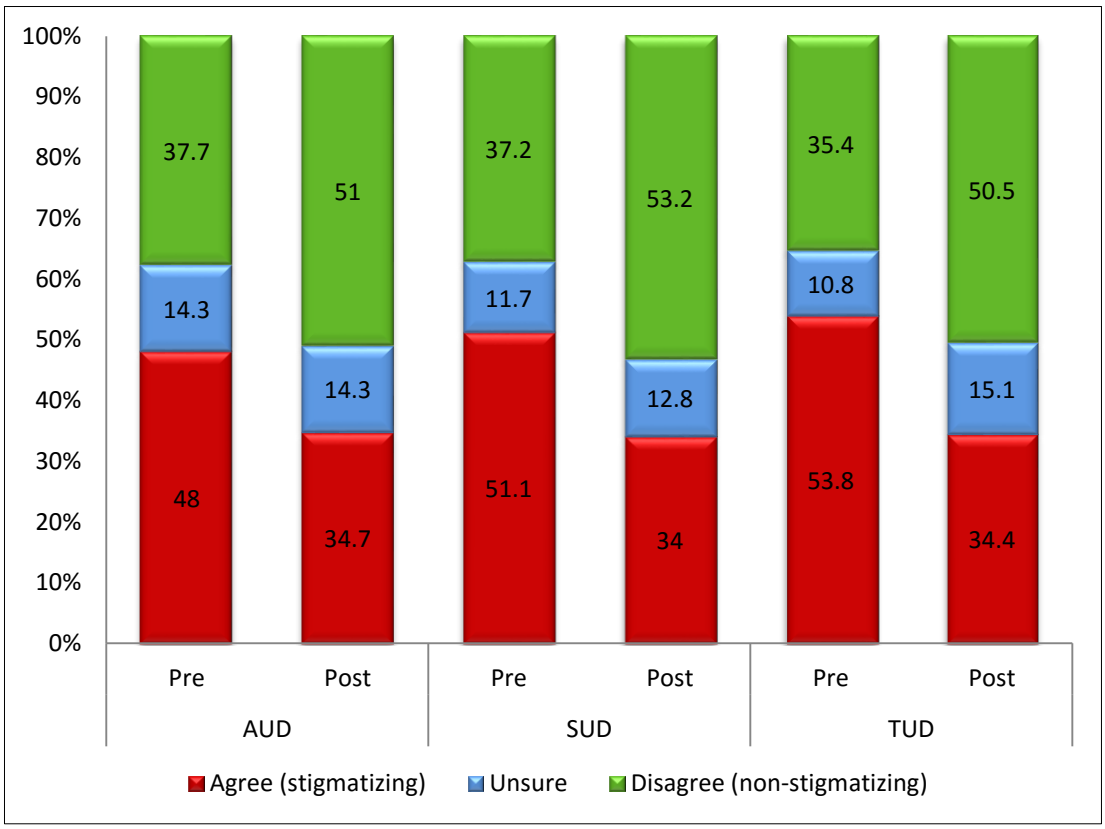

Figure 4.16: I struggle to feel compassion for a person with AUD/SUD/TUD.

4.5.7.2 Responsibility of Healthcare Providers towards those with AUD, SUD or TUD

A high proportion of respondents (83.7%, 83.7% and 85.3%) of respondents agreed that healthcare providers have a responsibility to inspire hope in people with AUD, SUD and TUD at baseline, respectively. These proportions reduced marginally at post-test to 82.7% for AUD and SUD and 84.2% for TUD. Interestingly, the proportion of respondents holding stigmatizing attitudes increased from 10.2% to 14.2% for AUD, 10.2% to 15.3% for SUD and 9.4% to 14.7% for TUD. The proportions of those who indicated that they were unsure also reduced from pre-test to post-test (Figure 4.17). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD (p = .389), SUD (p = .191) and TUD (p = .137).

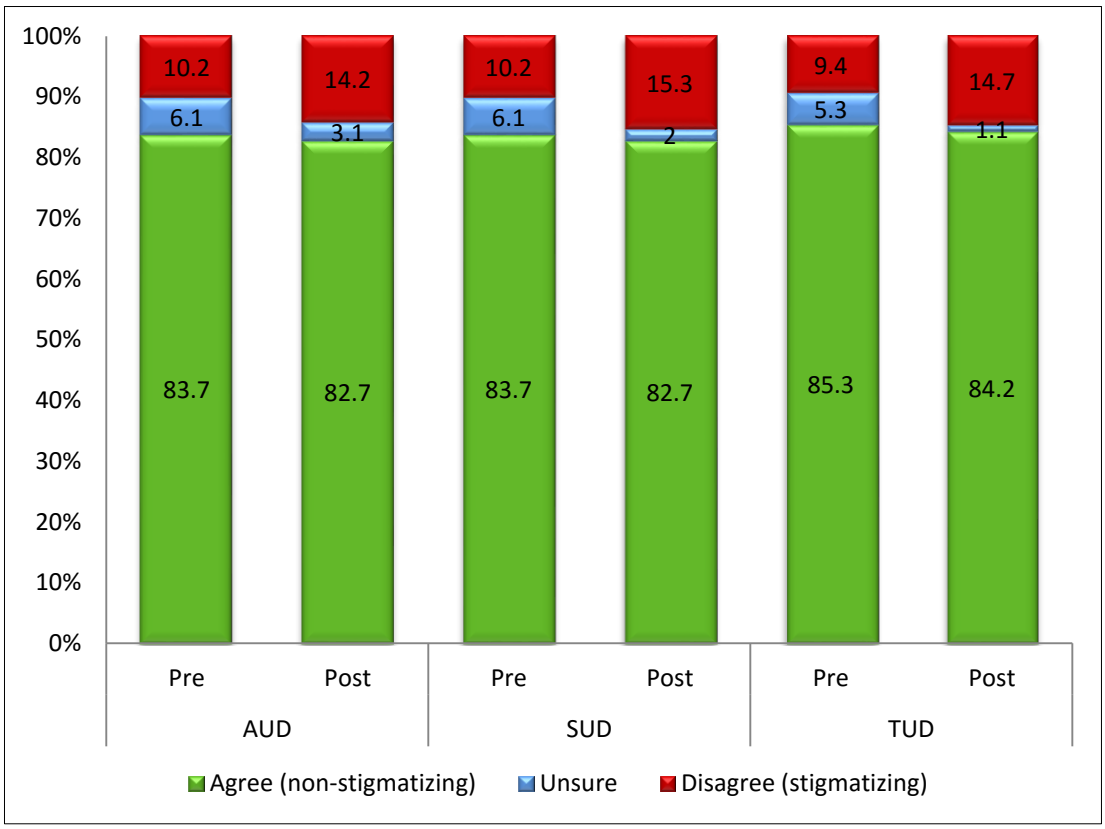

Figure 4.17: It is the responsibility of health care providers to inspire hope in people with AUD/SUD/TUD.

4.5.7.3 Negative Attitude towards people with AUD, SUD or TUD

During the pre-training assessment, 25.5%, 26.5% and 29.8% of respondents indicated having negative feelings towards individuals with AUD, SUD or TUD respectively and over the course of the training these proportions increased to 27.6% and 27.6% for AUD and SUD and reduced to 26.8% for TUD. Additionally there was a decline in the proportion of respondents who indicated that they were unsure - with the proportion for AUD reducing from 11.2% to 5.1%, that for SUD from 11.2% to 5.1% and TUD from 9.6% to 8.5%. Slight increases were also seen in the proportions holding non-stigmatizing attitudes from 63.3% to 67.3%, 62.3% to 67.3% and 60.6% to 63.8% for AUD, SUD and TUD respectively (Figure 4.18). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD ($p = .369$), SUD ($p = .386$) and TUD ($p = .888$).

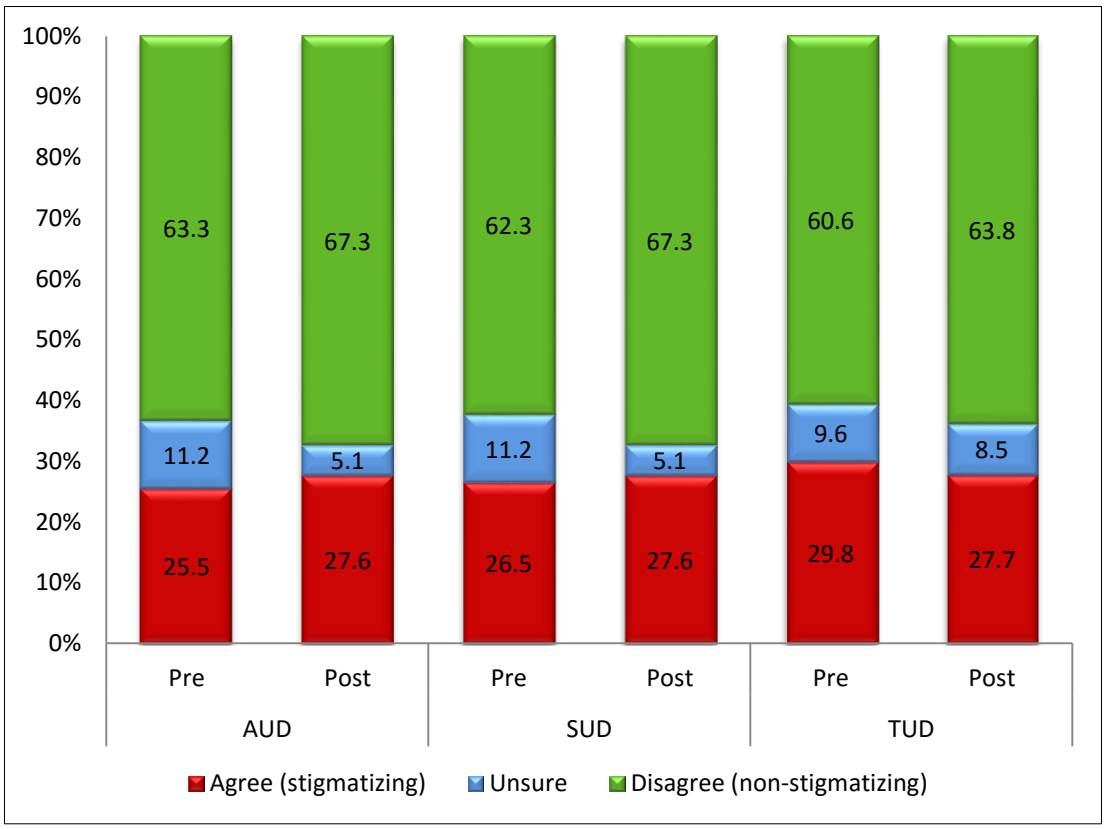

Figure 4.18: Despite my professional beliefs, I have negative reactions towards people who have AUD/SUD/TUD.

4.5.7.4 Assistance for People with AUD, SUD or TUD

At pre-test, 14.4%, 14.7% and 14.9% of respondents indicated that there was little they could do to help people with AUD, SUD and TUD respectively. After the training, Stigmatizing attitudes increased slightly for AUD, SUD and TUD to 17.5%, 16.8% and 18.1% respectively. There was also a similar increase in the proportion of people holding non-stigmatizing attitudes at post-test ranging from 75.3% to 77.3%, 75.8% to 76.9% and 75.5% to 77.6% for AUD, SUD and TUD respectively. Decreases were seen in the proportions of those indicating that they were unsure as shown in the figure below. Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD (p = .541), SUD (p = .748) and TUD (p = .354).

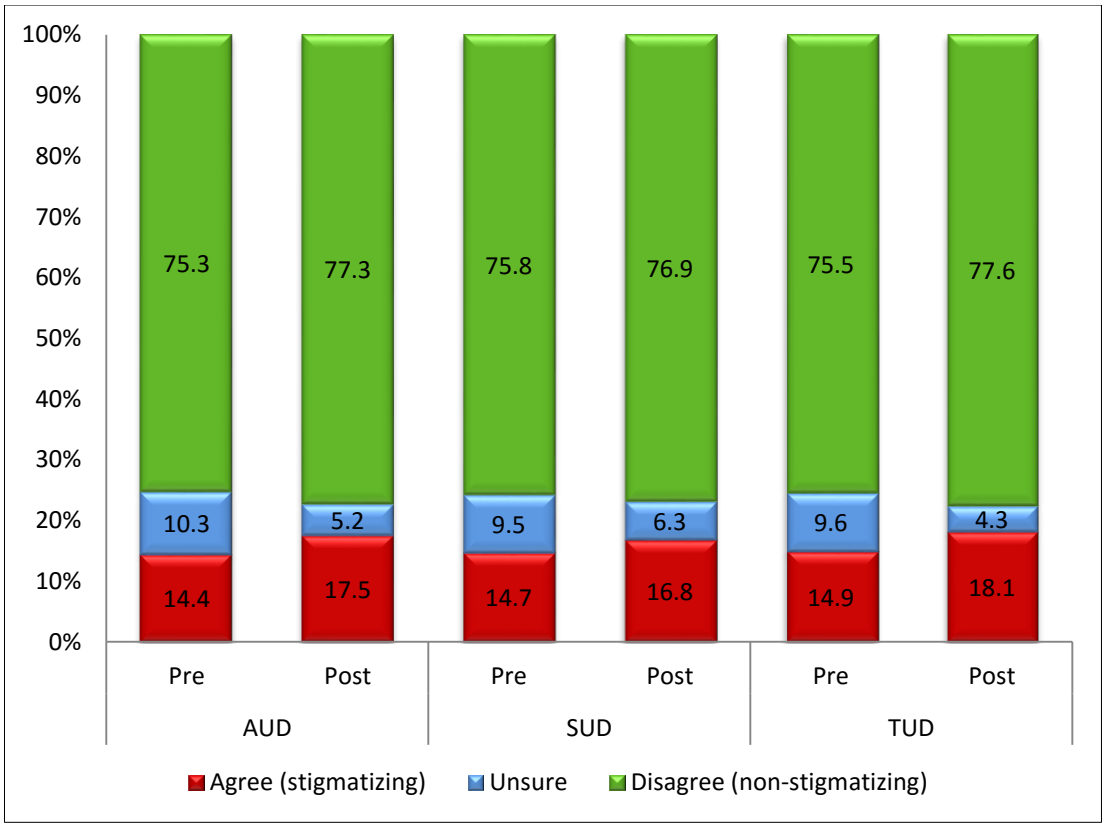

Figure 4.19: There is little I can do to help people with AUD/SUD/TUD.

4.5.7.5 Survey Item 18 - Social Responsibility

There was a slight increase at the post-test compared to the pre-test by 2.1% and 1.1% for AUD and SUD while the proportion for TUD remained unchanged. The proportions of people indicating that they were unsure for item 18 remained unchanged for AUD, with a decline of 1.1% for SUD and an increase of 1.1% for TUD. Additionally, 11.3%, 11.7% and 11.1% of respondents at post-test indicated stigmatizing responses towards people with AUD, SUD and TUD, respectively (Figure 4.20). Results from the McNemar-Bowker Test of Symmetry indicate that the changes in proportions of responses were not statistically significant for AUD (p = .284), SUD (p = .215) and TUD (p = .670).

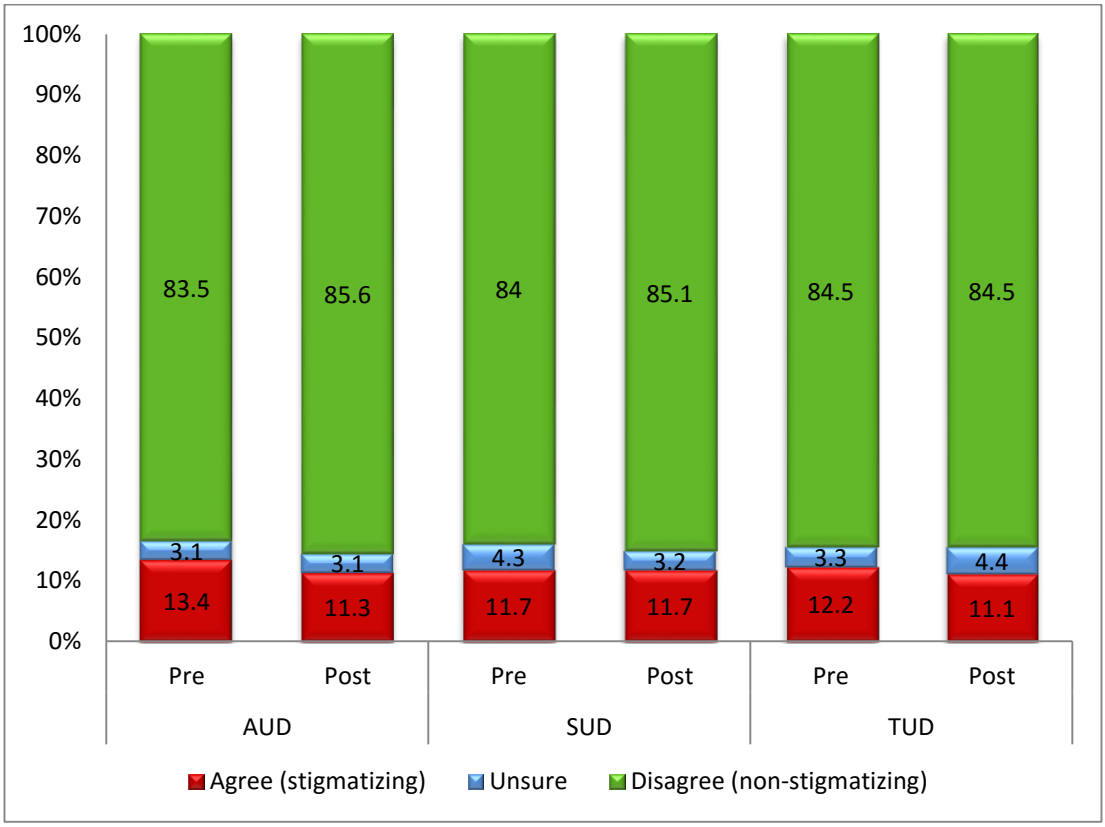

Figure 4.20: Healthcare providers do not need to be advocates for people with AUD/SUD/TUD.

4.6 Health Care Workers' Substance Use Rates

The lifetime substance use rate was 35.8% for alcohol, 23.5% for tobacco, 9.3% for cannabis, 8.8% for cocaine, 6.4% for amphetamine-like stimulants, 3.4% for inhalants, 9.3% for sedatives, 5.4% for hallucinogens, and 3.9% for opioids. Alcohol was the substance most frequently used in the previous three months (19.6%), with tobacco at 13.2%, cocaine at 5.4%, cannabis at 4.9%, sedatives and hallucinogens at 3.9%, amphetamine-type stimulants at 3.4% and opioids at 3.0%. Respondents were asked how often they had a strong urge to use various substances, in the previous three months; several respondents reported a strong urge to use alcohol (10.3%), tobacco (6.9%), cannabis (2.9%) and cocaine (3.9%). Figure 4.21 shows the distribution of substance use rates.

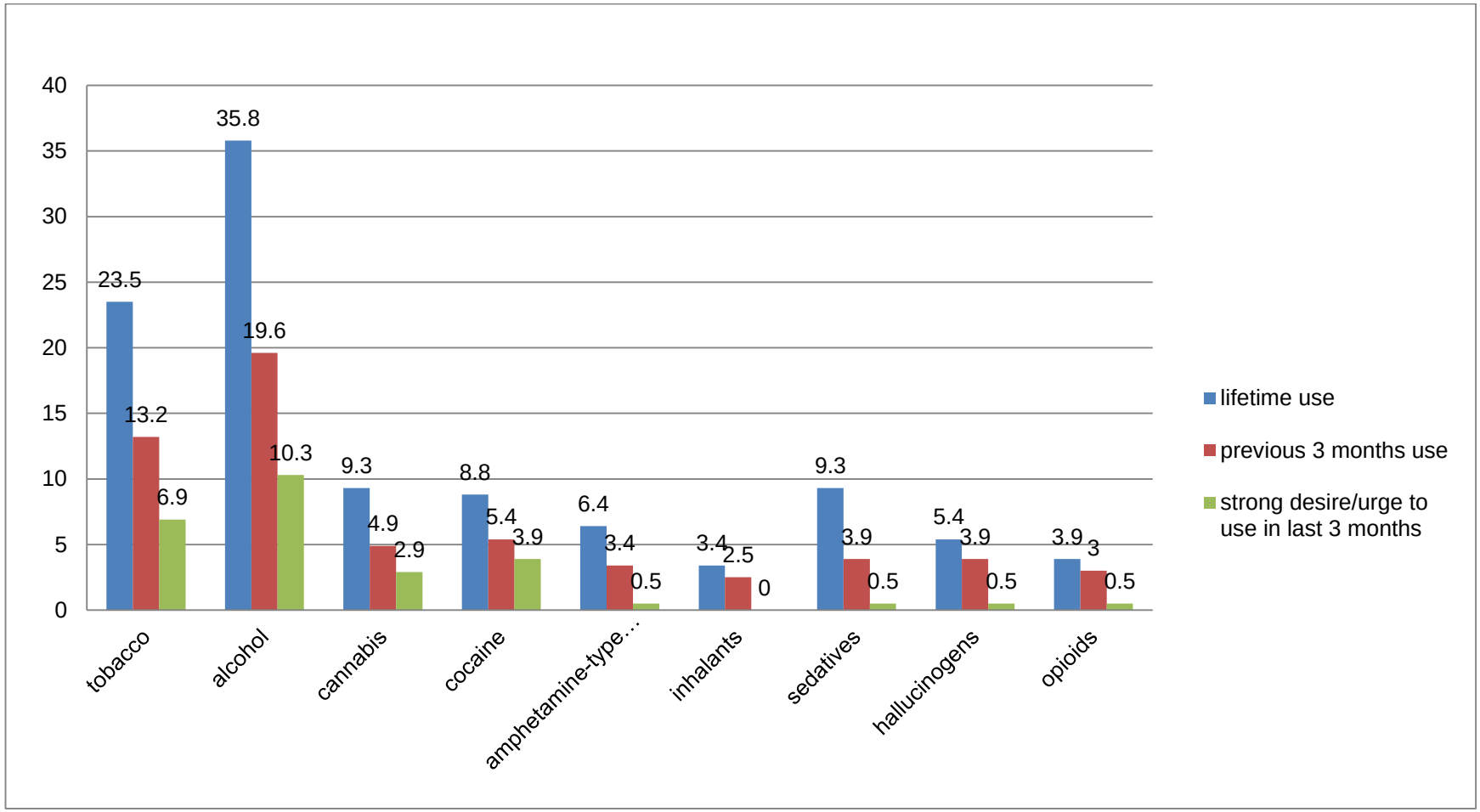

Figure 4.21: Healthcare Worker Substance Use Rates

Analysis of individual scores from the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) revealed that most HCWs had a low level of risk from their substance use. Tobacco was the only substance with a HCW reaching a high risk score (0.5%). Moderate risk use was observed at 11.8% for tobacco, 4.4% for cocaine, 3.4% for cannabis and sedatives, 2.9% for alcohol and hallucinogens, 2.5% for amphetamine-type stimulants and 1.5% for opioids. Workers at moderate risk might have experienced health, financial, social or legal issues from their substance use (0.5 to 2% depending on the substance), and/or have had difficulties fulfilling their roles and responsibilities (0 to 1%), have had someone expressed concerns about their use (0 to 4.4%), or tried to cut down without being successful (6.4% to 0). Only one percent of HCWs reported having ever used any drug by injection, using amphetamine-type substances, sedatives or hallucinogens.

4.7 Factors affecting Stigma towards people with AUD, SUD and TUD

4.7.1 Bivariate Analysis of Factors Affecting Stigma at Pre-test

Bivariate analysis using Pearson's product-moment correlation co-efficient flagged the socio-demographic variables that were associated with healthcare worker stigma towards people with Alcohol Use Disorders (AUD), Substance Used Disorders (SUD) and Tobacco Use Disorders (TUD) as shown in Table 4.5.

Table 4.5: Correlation matrix of Factors Affecting Stigma at Pre-test

		1	2	3
1	Stigma for AUD	-		
2	Stigma for SUD	0.99**	-	
3	Stigma for TUD	0.95**	0.95**	-
4	Owning Bicycle[a]	-0.16*	-0.15*	-0.15
5	e-learning is beneficial[b]	-0.19*	-0.18*	-0.22**
6	Confident to screen for SUD[c]	-0.18*	-0.11*	-0.12
7	Confident to identify SUD complications[c]	-0.14	-0.16*	-0.11
8	Confident to refer as appropriate[c]	-0.13	-0.15*	-0.09
9	Practice Confidence Score	-0.18*	-0.18*	-0.14
10	Lifetime Use of Inhalants[d]	0.15*	0.17*	0.15*
11	Previous 3 month Use of Tobacco[e]	0.15*	0.13	0.13
12	Previous 3 month Use of Inhalants[e]	0.26**	0.23**	0.25**
13	Previous 3 month Use of Hallucinogens[e]	0.16*	0.13	0.19*
14	ASSIST Score for Inhalants	0.26**	0.24**	0.26**
15	Risk Rating for Opioid Use[f]	0.16*	0.14	0.16*
16	Practice Confidence Score	-0.18*	-0.18*	-0.14

[a]Bicycle ownership: 1 = *yes*, 2 = *no*. [b]Self-efficacy: 1 = *strongly disagree*, 2 = *disagree*, 3 = *unsure*, 4 = *agree*, 5 = *strongly agree*. [c]Practice confidence: 1 = *unsure*, 2= *confident*, 3 = *very confident*. [d]Lifetime use: 1 = *yes*, 2 = *no*. [e]Previous 3 months use 0 = *never*, 2 = *once or twice*, 3 = *monthly*, 4 = *weekly*; 6 = *daily*. [f]Risk Rating: 1 = *low risk*, 2 = *moderate risk*, 3 = *high risk.* $^{*}p < .05$. $^{**}p < .01$.

4.7.2 Multivariate analysis of Factors Affecting Stigma at Pre-test

The results of the regression for stigma towards people with AUD indicated that the predictors (demographic variables) explained only 11.1% of the variance (R^2=.15, F (9, 196) = 3.85, $p < 0.001$). A positive attitude towards e-learning (β = -.17, p = 0.006) significantly predicted lower stigma towards people with Alcohol Use Disorders while previous 3 months use of inhalants (β = .17, p = 0.05) significantly predicted higher stigma among healthcare workers towards people with AUD (Table 4.6).

Table 4.6: Regression Model (Baseline Stigma for AUD)

Variables	β	t	Sig.	95% CI Lower Bound	Upper Bound
Owning Bicycle	-.10	-1.52	0.13	-4.73	0.61
e-learning is beneficial	-.17	-2.80	.006**	-2.30	-0.40
Confident to screen for SUDs (Unsure)[a]	.13	1.19	0.23	-1.42	5.79
Confident to screen for SUDs (Confident)[a]	0.06	0.56	0.57	-2.13	3.83
Practice Confidence Score	-0.10	-1.21	0.23	-0.27	0.07
Moderate Risk Opioid Use[b]	0.09	1.19	0.23	-3.63	14.78
Previous 3 month Inhalant Use	0.17	1.97	0.05*	-.003	4.32
Lifetime Inhalant Use	0.10	1.38	0.17	-3.10	17.68
Previous 3 month Tobacco Use	0.02	0.22	0.82	-1.68	2.11

Note. Dependent Variable: Baseline Opening Minds Scale for Healthcare Workers Stigma Score for Alcohol Use Disorders. [a]*very confident* is reference category. [b]*low risk* is reference category. *$p < .05$. **$p < .01$.

The results of the regression for stigma towards people with SUD indicated that the predictors (demographic variables) explained only 9.8% of the variance (R^2=.15, F (12, 193) = 2.87, p = 0.001). A positive attitude towards e-learning (β = -0.18, p = 0.008) significantly predicted lower stigma towards people with Substance Use Disorders among healthcare workers (Table 4.7).

Table 4.7: Regression Model (Baseline Stigma for SUD)

Variables	β	t	Sig.	95% CI Lower Bound	Upper Bound
Owning Bicycle	-0.13	-1.81	0.07	-5.31	0.23
e-learning is beneficial	-0.18	-2.67	0.008**	-2.34	-0.35
Confident to screen for SUDs (Unsure)[a]	0.11	0.99	0.32	-1.88	5.68
Confident to screen for SUDs (Confident)[a]	0.06	0.53	0.60	-2.32	4.01
Confident to identify SUD complications (Unsure)[a]	0.07	0.54	0.59	-3.30	5.79
Confident to identify SUD complications (Confident)[a]	-0.09	-0.75	0.46	-4.81	2.16
Confident to refer as appropriate (Unsure)[a]	0.08	0.49	0.62	-3.87	6.44
Confident to refer as appropriate (Confident)[a]	0.05	0.36	0.72	-3.39	4.89
Practice Confidence Score	-0.03	-0.25	0.80	-0.26	0.20

Note. Dependent Variable: Baseline Opening Minds Scale for Healthcare Workers Stigma Score for Substance Use Disorders. [a]*very confident* is reference category. $^{*}p < .05$. $^{**}p < .01$.

The results of the regression for stigma towards people with TUD indicated that the predictors (demographic variables) explained only 10.3% of the variance (R^2= 0.13, F (6, 198) = 4.90, $p < 0.001$). A positive attitude towards e-learning (β = -0.20, p = 0.003) significantly predicted lower stigma among healthcare workers towards people with Tobacco Use Disorders, while moderate risk opioid use (β = 0.16, p = 0.021) predicted a higher level of stigma towards people with TUD (Table 4.8).

Table 4.8: Regression Model (Baseline Stigma for TUD)

Variables	β	t	Sig.	95% CI Lower Bound	Upper Bound
e-learning is beneficial	-0.20	-2.97	0.003**	-2.43	-.49
Moderate Risk Opioid Use[a]	0.16	2.33	0.02*	1.51	18.10

Note. Dependent Variable: Baseline Opening Minds Scale for Healthcare Workers Stigma Score for Tobacco Use Disorders. [a]*low risk* is reference category. $^{*}p < .05$. $^{**}p < .01$.

4.8 Factors Affecting Change in Stigma Level after Web-based Training

4.8.1 Bivariate Analysis of Change in Stigma Level after Web-based Training

Bivariate analysis using Pearson's product-moment correlation co-efficient flagged the socio-demographic variables that were associated with change in healthcare worker stigma towards people with Alcohol Use Disorders (AUD), Substance Used Disorders (SUD) and Tobacco Use Disorders (TUD) as shown in Table 4.9.

Table 4.9: Change in Stigma Correlation Matrix

	Variables	1	2	3
1	Change in Stigma score for AUD	–		
2	Change in Stigma score for SUD	0.99**	–	
3	Change in Stigma score for TUD	0.99**	0.99**	–
4	Confident to seek advice from mentor[a]	0.21*	0.22*	0.21*
5	Confident to identify SUD complications (Post training)[a]	-0.24*	-0.24*	-0.26**
6	Pre-test stigma score AUD	-0.74**	-0.73**	-0.73**
7	Pre-test stigma score SUD	-0.74**	-0.75**	-0.74**
8	Pre-test stigma score TUD	-0.74**	-0.74**	-0.75**

[a]Practice confidence: 1 = *unsure*, 2= *confident*, 3 = *very confident*. *$p < .05$; **$p < .01$

4.8.2 Multivariate analysis of Change in Stigma

Variables that significantly correlated with change in stigma towards people with alcohol use disorders were modelled together using Multiple Linear Regression. The results of the regression for change in stigma towards people with AUD indicated that the predictors (demographic variables) explained only 10.6% of the variance (R^2= 0.17, F (7, 88) = 2.62, p = 0.02). None of the predictors significantly predicted change in the level of stigma towards people with alcohol use disorders, as shown in Table 4.10.

Table 4.10: Regression Model (Change Stigma for AUD)

Variable	β	T	Sig.	95% CI Lower Bound	Upper Bound
Confident to seek mentor advice (disagree)[a]	-0.06	-0.61	0.54	-9.64	5.09
Confident to seek mentor advice (unsure)[a]	-0.12	-1.15	0.25	-18.07	4.81
Confident to identify (Unsure)[b]	0.13	1.04	0.30	-3.23	10.27
Confident to identify (confident)[b]	0.06	0.45	0.66	-3.99	6.30
Baseline Stigma Score AUD	-0.88	-0.79	0.44	-3.92	1.70
Baseline Stigma Score SUD	0.90	0.71	0.48	-2.06	4.36
Baseline Stigma Score TUD	-0.41	-0.81	0.42	-1.82	0.76

Note. Dependent Variable: Difference in Stigma Score for Alcohol Use Disorders. [a]*agree* is reference category. [b]*very confident* is reference category; $^{*}p < .05$. $^{**}p < .01$.

Variables that significantly correlated with change in stigma towards people with substance use disorders were modelled together using Multiple Linear Regression. The results of the regression for change in stigma towards people with SUD indicated that the predictors (demographic variables) explained only 10.3% of the variance (R^2= 0.17, F (7, 88) = 2.55, p = 0.02). None of the predictors significantly predicted change in the level of stigma towards people with substance use disorders, as shown in Table 4.11.

Table 4.11: Regression Model (Change Stigma for SUD)

Variable	β	t	Sig.	95% CI Lower Bound	Upper Bound
Confident to seek mentor advice (disagree)[a]	-0.07	-0.66	0.51	-9.83	4.91
Confident to seek mentor advice (unsure)[a]	-0.11	-1.11	0.27	-17.84	5.05
Confident to identify (Unsure)[b]	0.11	0.87	0.39	-3.81	9.70
Confident to identify (confident)[b]	0.03	0.24	0.81	-4.53	5.76
Baseline Stigma Score AUD	-0.14	-0.13	0.90	-2.99	2.64
Baseline Stigma Score SUD	0.17	0.14	0.89	-2.99	3.43
Baseline Stigma Score TUD	-0.41	-0.82	0.41	-1.83	0.76

Note. Dependent Variable: Difference in Stigma Score for Substance Use Disorders. [a]*agree* is reference category. [b]*very confident* is reference category; $^{*}p < .05$. $^{**}p < .01$.

Variables that significantly correlated with change in stigma towards people with tobacco use disorders were modelled together using Multiple Linear Regression. The results of the regression for change in stigma towards people with TUD indicated that the predictors (demographic variables) explained only 11.8% of the variance (R^2= 0.18, F (7, 88) = 2.81, p = 0.01). None of the predictors significantly predicted change in the level of stigma towards people with tobacco use disorders, as shown in Table 4.12.

Table 4.12: Regression Model (Change Stigma for TUD)

Variable	β	t	Sig.	95% CI Lower Bound	Upper Bound
Confident to seek mentor advice (disagree)[a]	-0.09	-0.87	0.39	-10.65	4.15
Confident to seek mentor advice (unsure)[a]	-0.11	-1.10	0.27	-17.86	5.13
Confident to identify (Unsure)[b]	0.12	0.99	0.33	-3.41	10.16
Confident to identify (confident)[b]	0.03	0.25	0.80	-4.52	5.82
Baseline Stigma Score AUD	-0.95	-0.85	0.40	-4.03	1.62
Baseline Stigma Score SUD	1.38	1.10	0.28	-1.45	5.00
Baseline Stigma Score TUD	-0.80	-1.62	0.11	-2.35	0.24

Note. Dependent Variable: Difference in Stigma Score for Tobacco Use Disorders. [a]*agree* is reference category. [b]*very confident* is reference category; $^{*}p < .05$. $^{**}p < .01$.

4.9 Awareness of Alcohol, Tobacco and Substance Use in Practice

4.9.1 Comparison of Self-Reported Prevalence Estimates from Pre-test to Post-test

Respondents were asked to estimate the prevalence of alcohol, substance and tobacco use disorders based on their day to day experience at their place of work. On average, the mean estimates in terms of diagnosis increased over the duration of the study as seen by the post-test scores; however, these increases were not statistically significant (Table 4.13).

Table 4.13: Change in Self-Reported Prevalence Estimates from Pre-test to Post-test for AUD, SUD and TUD

	Pre-test Mean (95% CI)	Post-test Mean (95% CI)	Paired t-test (*p*)
Alcohol Use Disorders	27.20 (22.29 – 32.11)	29.74 (23.31 – 36.17)	0.30
Substance Use Disorders	23.42 (18.25 – 28.59)	24.41 (20.18 – 28.63)	0.36
Tobacco Use Disorders	24.89 (20.12 – 29.67)	28.31 (23.37 – 33.25)	0.40

Note. $^{*}p< 0.05$, $^{**}p< 0.01$

4.9.2 Referral of Alcohol, Tobacco and Substance Use Cases in Practice

Over the course of the training a higher proportion (81.7%) of respondents indicated that they were aware of a mental health worker within their institution to whom they could refer cases of alcohol, tobacco and substance use compared to 69.5% who indicated knowledge of a mental health worker at their institution (Proportions were the same across the three substances i.e. Alcohol Use, Substance Use and Tobacco Use) (Figure 4.22). This represented a statistically significant (χ^2 (2) = 8.45, p = 0.02) increase from pre-test to post-test.

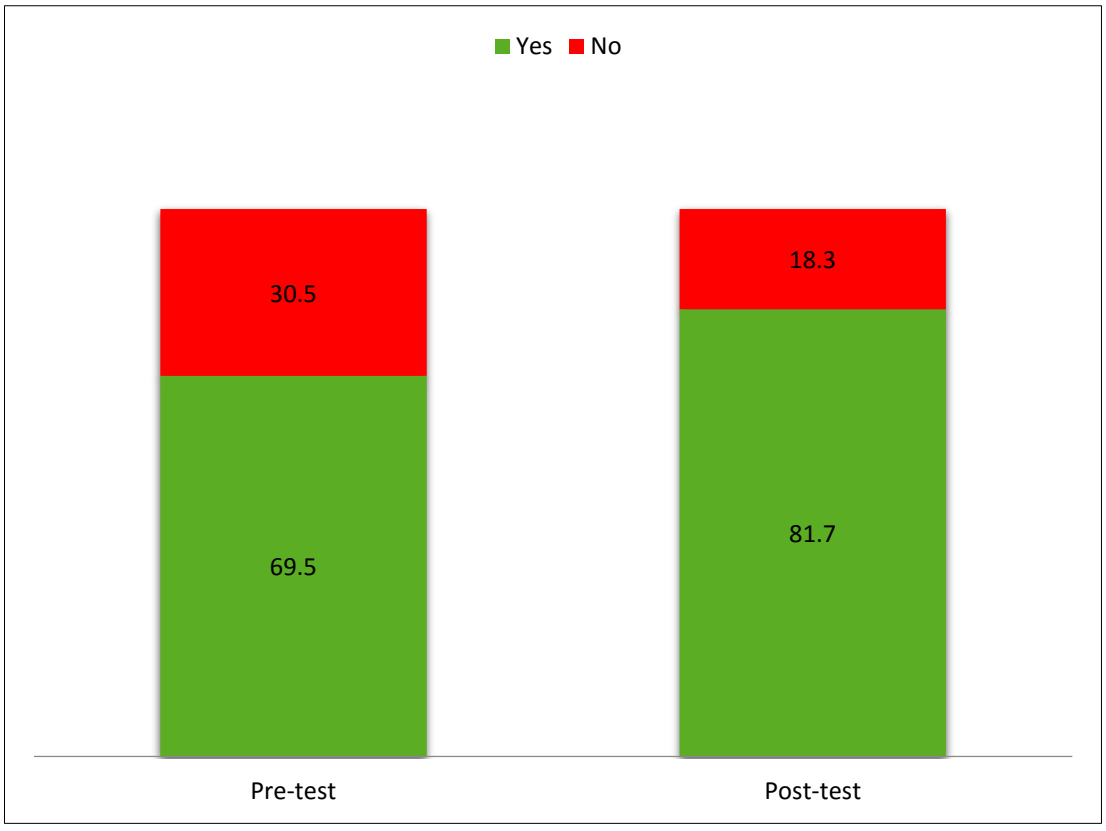

Figure 4.22: Are you aware of a Mental Health Worker at your facility?

4.9.3 Management of Patients with Alcohol, Substance and Tobacco Use Problems

Respondents were asked to rate their ease in handling patients who present with alcohol, tobacco or substance use problems. Overall between the pre-test and post-test, there was a statistically significant increase in the self-reported level of ease in handling these patients (Table 4.14).

Table 4.14: Ease of Management of Patients with SUD

	Ease of Management Rating Scale	Pre-test	Post-test	McNemar-Bowker Test
Alcohol Use Disorders	Very Comfortable	9.4% (9)	14.6% (15)	χ^2 (6) = 22.77, **p = .001****
	Comfortable	31.3% (30)	55.2% (53)	
	A little comfortable	43.8% (42)	26.0% (25)	
	Not at all comfortable	15.6% (15)	4.2% (4)	
Substance Use Disorders	Very Comfortable	9.1% (8)	14.8% (13)	χ^2 (6) = 21.84, **p = .001****
	Comfortable	33.0% (29)	55.7% (49)	
	A little comfortable	39.8% (35)	27.3% (24)	
	Not at all comfortable	18.2% (16)	2.3% (2)	
Tobacco Use Disorders	Very Comfortable	9.4% (8)	20.0% (17)	χ^2 (6) = 22.76, **p = .001****
	Comfortable	37.6% (32)	54.1% (46)	
	A little comfortable	36.5% (31)	21.2% (18)	
	Not at all comfortable	16.5% (14)	4.7% (4)	

Note. $^{*}p < 0.05$, $^{**}p < 0.01$

4.9.4 Alcohol, Substance and Tobacco Use Disorders Training

There was almost unanimous agreement from all respondents at pre-test (85.4%) and post-test (91.6%) on the need for further training and refresher courses for people in the health sector at all levels. The most common reason stated for this need was that the training is relevant not only professionally at the facility but also socially in the community, where these disorders are commonplace.

4.9.5 Responsibility for Management of Alcohol, Tobacco and Substance Use Disorders

About three-quarters (73.8%) of respondents at pre-test opined that non-psychiatrists and non-specialized hospital staff have a role to play in the recognition and management of alcohol, tobacco and substance use disorders, compared to 88.9% at post-test (Figure 4.23). This represented a statistically significant increase from pre-test to post-test (χ^2 (2) = 10.32, p = .006).

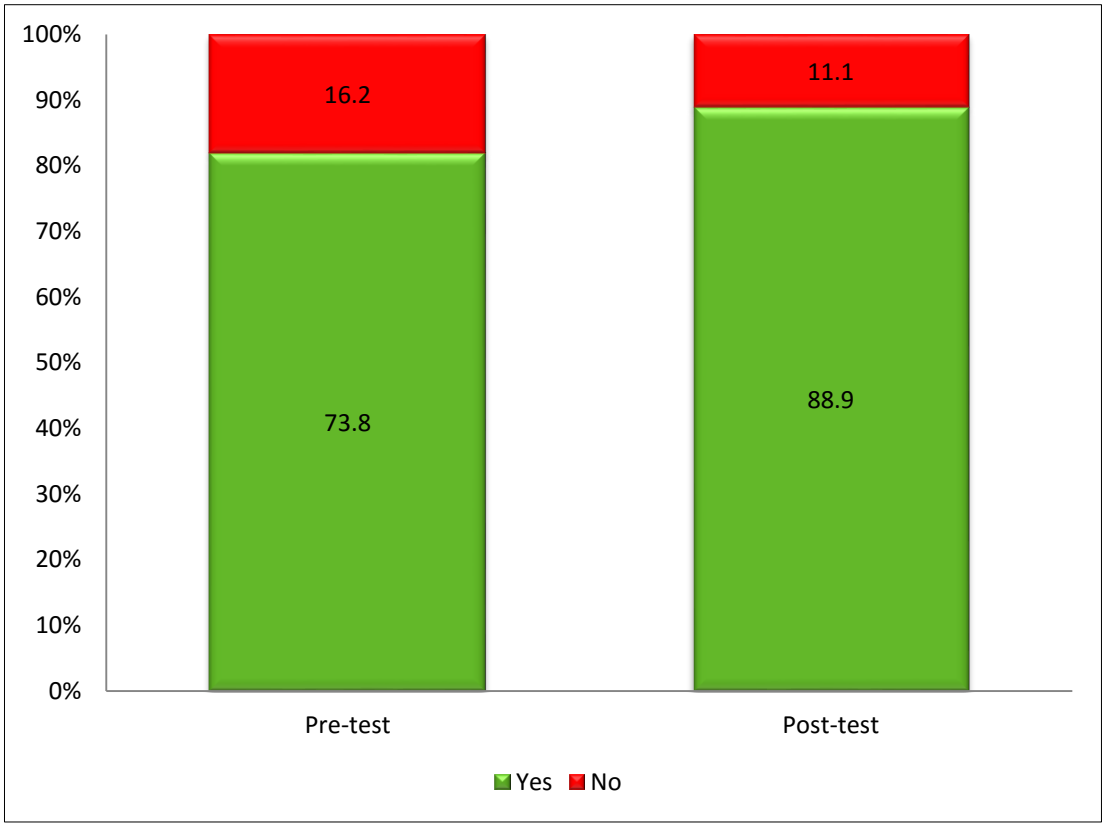

Figure 4.23: Do Non-psychiatrists have a role in management of SUDs?

CHAPTER FIVE
DISCUSSION

5.1 Effect of Web-based Training on Healthcare Worker Knowledge

The mentor-supported web-based trainings on screening and primary care management of alcohol, tobacco and substance use disorders delivered at 11 health facilities in Kenya was a success. It provided increased knowledge and skills acquisition on addressing SUD effectively in primary care to more than 102 health workers who had no prior training in the area; and, as shown by other studies – they may have previously encountered cases of SUD that were unrecognized, hence untreated. Studies done in various public and private facilities lead to the conclusion that more often than not, healthcare workers do not routinely recognize and intervene for mental disorders - including SUD (Ndetei *et al.*, 2011; Othieno *et al.*, 2000).

Other studies confirm that web-based training is fast emerging as an efficient and cost-effective means of delivering mental health education for healthcare providers (McMillen, Hawley, & Proctor, 2015) and can be just as effective as face to face training (Stein *et al.*, 2015). A meta-analysis of studies on Continuing Medical Education (CME) from 1993 to 1999 revealed that didactic-only CME sessions i.e. seminar style teaching, barely have any impact on physician behaviour (Davis *et al.*, 1999). Interactive sessions, on the other hand, improve not only the professional practice of physicians but also - in a few cases - the health outcomes for patients and clients (Davis *et al.*, 1999). Other studies also support the finding that web-based training may be a better strategy for skill-acquisition and increased practice confidence compared to didactic learning (Harris *et al.*, 2001; Cunningham, 2004).

Since there are a limited number of studies that have used a similar web-based training approach as an anti-stigma intervention for AUD, SUD and TUD (Livingston *et al.*, 2012), the findings of this study provide important and novel insights for Kenya, in particular, and are likely valid for other LMIC with a similar context. Based on this study and other emerging literature on stigma reduction, mentor-supported web-based training is a promising strategy for stigma-reduction among healthcare workers in

LMIC with similar contexts as Kenya. Stigma reduction and increased training (knowledge and skills) of health workers are important components required to improve the provision of evidence-based intervention to those populations in great need of them – it is indeed encouraging to have discovered an intervention that appears to successfully address both at once, in a cost-effective, easily scalable manner.

5.2 Effect of Web-based Training on Healthcare worker Stigma

Importantly, not only did the training provide new knowledge and skills acquisition, but it also seems to have been effective in terms of decreasing stigmatizing attitudes. At Pre-test, HCWs in the study had low to moderate levels of stigma towards people with AUD (*M*=52.37), SUD (*M*=52.40) and TUD (*M*=52.36), on a stigma score scale of 20 to 100. Comparison of overall pre-test and post-test stigma scores indicated that after the web-based training, two-thirds of the healthcare workers became less stigmatizing towards people with AUD, SUD and TUD. This is a similar finding to the Canadian study which showed a decrease in stigmatizing attitudes towards mental illness, in general, after a contact-based educational intervention (Patten *et al.*, 2012).

Taken in totality, educational interventions have been used successfully in different jurisdictions, comprised of several different demographics, to bring about a reduction in stigma and an increase in mental health literacy. Similar to our study, a study carried out among Canadian healthcare providers showed a comparable decrease in stigma level (Assessed using the OMS-HC) after a training intervention – albeit after seminar-style contact-based education (Patten *et al.*, 2012). Pinfold *et al.* (2003) showed that short educational workshops were effective in improving the attitudes of British secondary school students towards people with mental disorders. Similar results were seen among Canadian university students (Lillie, 2013). Further, web-based training has been used effectively to reduce self-stigma among people with depression (Griffiths & Christensen, 2007; Griffiths *et al.*, 2004).

5.2.1 Factors Associated with Healthcare Worker Stigma

This study found that individually held stigma towards people with AUD, SUD and TUD is highly correlated i.e. Stigma towards people with AUD is positively correlated with stigma towards people with SUD ($p < .001$) and TUD ($p < .001$). Health worker stigma towards people with SUD was also positively correlated with the stigma held towards people with TUD ($p < .001$). This suggests that stigma towards a person having any of these three conditions implies stigma towards people having the other two. It seems to suggest also, that among this sample of healthcare professionals, efforts to reduce stigma for any of the three conditions (e.g. AUD) will result in a proportionate reduction in stigma towards people with the other two conditions (e.g. SUD, TUD). Others studies have shown that alcohol, substance and tobacco users are severely stigmatized in the society (Room, 2005) and by healthcare workers (Ronzani, Higgins-Biddle, & Furtado, 2009). Conversely, however, a separate study showed that tobacco use is less stigmatized than either alcohol or substance use (Cunningham, Sobell, & Chow, 1993).

This study showed that healthcare workers who owned bicycles were more likely to have higher stigma towards people with AUD and SUD, over their counterparts who did not own bicycles. Economic studies done in Kenya and East Africa show that bicycle ownership is often an indicator of a lower-middle income standard of living in Kenya (Johnson & Nino-Zarazua, 2009; Johnston & Abreu, 2013). Studies have shown that people with a lower socioeconomic status have a tendency to stigmatize people with mental illness (Golberstein, Eisenberg, & Gollust, 2008) – similar to our study findings.

Healthcare workers who indicated a positive attitude towards learning about the prevention and treatment of substance use disorders via web-based training were more likely to have a lower level of stigma towards people with AUD and SUD at bi-variate and multivariate analysis; suggesting perhaps that healthcare workers who are cognisant of gaps in their knowledge about substance use disorders are less likely to hold stigmatizing attitudes towards people with these conditions. There is a paucity of

data on a possible link between individual self-awareness of knowledge gaps and stigma for mental illness or substance use disorders specifically.

Healthcare workers who indicated confidence in screening for SUDs in general had lower stigma towards people with AUD and SUD. Those who indicated confidence in identifying high risk complications that need immediate medical attention had lower stigma towards people with SUD than those who said that they did not know how to identify high risk complications. A similar trend was seen among those who expressed confidence in their ability to refer cases appropriately; they had lower stigma towards people with SUD than those who said they aren't confident handling SUD referrals. Overall, respondents with a higher Practice Confidence Score tended to have lower stigma towards people with AUD and SUD, while there was no significant association between the practice confidence score and stigma towards people with TUD. Studies on healthcare worker training in mental illness from other parts of the world have shown that when healthcare providers feel confident about implementing screening and management for mental disorders, they are more likely to exhibit low stigma (MacCarthy *et al.*, 2013), similar to the findings of this study.

It is also important to mention that for this study, practice confidence was not at all related with stigma towards people with Tobacco Use Disorders. This is perhaps suggestive that stigma towards people with Tobacco Use Disorders is firmly entrenched. This finding is also supported by other studies which show that there exists different levels of stigma for people with AUD, SUD or TUD – with tobacco use being the most severely stigmatized (Ronzani *et al.*, 2009).

Healthcare workers who had used tobacco, inhalants or hallucinogens in the three months preceding the study had higher stigma than those who hadn't used any of the substances. Further, those who indicated lifetime use of inhalants, those who had high ASSIST Scores for inhalant use and those who used opioids at levels that exposed them to moderate risk had higher stigma towards people with AUD, SUD and TUD. Many studies show the link between stigma or perceived stigma and alcohol or drug use; (Palamar, 2012; Room, 2005). These findings, however, suggest that the link may

be bi-directional i.e. that drug use may be a risk factor for stigma towards people with Alcohol Use Disorders, at least among healthcare workers.

It is also important to mention that, contrary to other studies (Corrigan, Watson, & Barr, 2006; Keyes *et al.*, 2010), gender and level of education were not significantly associated with the level of stigma towards substance use disorders in this study. This suggests, perhaps, that anti-stigma interventions can be applied across the board for all healthcare workers irrespective of gender or level of education.

5.2.2 Dimensions of Stigma Affected by Web-based Training

Further analysis of the various dimensions of stigma measured by the 20-item OMS-HC Survey revealed that our training had mixed results as far as Social Distance was concerned. There was a significant increase in the level of comfort in dealing with people with AUD, SUD, and TUD (lower stigma) after the training, similar to other studies (Corrigan *et al.*, 2010; Dalky, 2012; Hansson & Markström, 2014). However, significantly more healthcare workers indicated that they would not want a person with SUD – even if the condition were managed – to work with children. This is congruent with other findings to the effect that increased knowledge about mental illness may increase social distance towards people with mental illness in general (Adewuya & Oguntade, 2007; Lauber *et al.*, 2004).

Conversely, a higher proportion of healthcare workers indicated that they would not mind living next door to a person with SUD. This perhaps suggests that while the healthcare workers themselves would not mind interacting regularly with people who have SUD, they would be reluctant about exposing the same individuals to children. Additionally, after the training, a lower proportion of respondents indicated that they would see themselves as weak if they had AUD, SUD or TUD – which was indicative of a reduction in self-stigma. This supports the assertion that efforts to increase knowledge and skills acquisition to address a condition are important strategies for combating self-stigma (Mittal, Sullivan, Chekuri, Allee, & Corrigan, 2012). Social Responsibility towards people with SUD or TUD also increased significantly after the

training – with more healthcare workers expressing compassion for people with these conditions. It is important to note that an increase in Social Responsibility did not improve for AUD. Furthermore, a significantly higher proportion of healthcare workers indicated that they would not see a physician who was in recovery from AUD – corroborating findings from a German study which showed that alcohol dependence is severely stigmatized (Schomerus *et al.*, 2010).

5.3 Healthcare Worker Substance Use

There is a high level of substance use among healthcare workers in the study sites compared to the general Kenyan population. This is concerning since most of these substances are associated with multiple health complications (Humeniuk *et al.*, 2010). For example cannabis use is associated with cardiovascular and respiratory complications (Jouanjus, Lapeyre-Mestre, & Micallef, 2014; Tashkin, 2015), mild cognitive impairment (Panza *et al.*, 2012), dementia (Hulse, Lautenschlager, Tait, & Almeida, 2005; Xu *et al.*, 2009), and stroke (Esse, Fossati-Bellani, Traylor, & Martin-Schild, 2011; Fonseca & Ferro, 2013).

Healthcare workers in this study reported high risk level use only for tobacco. However, use of the other substances, even at low to moderate risk levels, may exert a higher total burden on the public health system than harmful, high risk use (Humeniuk *et al.*, 2010), due to the associated health, social, legal and financial problems. Additionally, healthcare workers' lifestyle choices effect their patients' health practices (Frank, Dresner, Shani, & Vinker, 2013; Oberg & Frank, 2009), including regarding substance use practices (Frank, Elon, Naimi, & Brewer, 2008; Voltmer, Frank, & Spahn, 2013).

CHAPTER SIX
CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

This study found that the mean stigma scores at baseline were 52.37 (CI: 50.73 – 54.01), 52.40 (CI: 50.77 – 54.04) and 52.36 (CI: 50.76 – 53.97) for stigma towards people with AUD, SUD and TUD respectively. The mean stigma scores after the web-based training were 49.46 (CI: 47.48 – 51.44), 49.36 (CI: 47.39 – 51.34) and 49.65 (CI: 47.67 – 51.62), for stigma towards people with AUD, SUD and TUD respectively. This represents a reduction in mean stigma score after the web-based training - hence a reduction in stigma among healthcare workers who participated in the web-based training. This stigma reduction was related to decrease in social distance and self-stigma and increased social responsibility towards people with these disorders. Stigma increments after the training were seen in aspects of Recovery and Social Distance as it relates to children.

The level of use of various substances, specifically alcohol, tobacco, sedatives and cannabis among healthcare workers, places them at risk of developing the related disorders and is cause for concern. Overall, after participation in the web-based training on substance use disorder prevention and management, HCWs reported increased knowledge and skills in screening, case recognition and case management as relates to substance use disorders in practice. In addition, there was increased knowledge on the role of non-psychiatric staff in the detection and management of substance use disorder cases in primary care settings.

6.2 RECOMMENDATIONS

Based on the study findings the following recommendations are made:

1. This web-based training program should be rolled out countrywide to combat the likely existing moderate levels of stigma towards people with AUD, SUD and TUD.

2. The use of web-based training as a platform for continuing medical education should be encouraged as a cost effective means of increasing and enhancing healthcare worker knowledge and skills not only in Kenya but also in other similar low and middle income countries.
3. Further research should be carried out on the dimensions of stigma that increased even after the web-based training - specifically recovery and social distance - with the aim of reversing this trend in future.
4. Healthcare workers should be sensitized on the effect that their personal substance use has on their patients' health and adherence to case management interventions related to substance use.
5. Further research is required to determine which component of the intervention might be most effective in affecting stigma (mentored activities, peer activities, reading, or other aspects of the training, such as, perhaps, increased recognition in practice of those with SUD and decreased stigma through direct contact with people identified with SUD).
6. It would also be appropriate to study stigma toward health workers who provide care to those suffering from SUD, or with policy makers, and to assess if these types of stigma can also be addressed through web-based training.

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APPENDICES

Appendix I: Consent and Advice Form

My name is _____a research assistant on behalf of **Mr. Aggrey G. Mokaya,** of P.O Box 61831-00200, Nairobi, Kenya As a health worker in this District, you qualify for participation in the research study titled **"The Effect of Web-based Training in Prevention and Treatment of Substance Use Disorders (SUDs), on Structural Stigma among Healthcare workers in a Low Income Setting"** however, before you decide to participate or not, let me first tell you about the study.

Purpose of the study:

The purpose of this project is to answer the challenge of integration of screening and core packages of Mental Health and Substance Use Disorder services into routine primary health care through innovative e-learning technologies, including learning on knowledge, skills and attitude needed to effectively provide Substance Use Disorder screening and care, as well as training on how to support practitioners in integrating those new services into their current clinical practice.

Should you accept to participate in the study you will be trained through e-learning on the screening for SUD and expected to spend 2 hours a week on e - learning. You will be expected to (1) complete the training and all its educational activities, (2) use the techniques you have learned with appropriate non-judgmental attitude and communication; (3) assist in identifying and managing co-morbidities; (4) provide basic psychological and pharmaceutical treatment; (5) assist patients and families with self-help strategies; (6) determine the need for, and feasibility of, referral and follow-up and (7) abide by the research protocol, which will include asking you to take notes of the clinical interventions you are providing in relation to tobacco, alcohol use, and other substance use disorders, as well as their co-morbidities and complications. You will be given supportive supervision by clinicians with experience in the techniques taught, that will be identified as your mentor(s). In turn those clinicians will have access to very specialized physicians and psychologist if they need too, in order to assist you. You will be expected to observe the usual patients confidentiality. Patients who participate in the study will signed a separate consent to share their clinical information with the research team. For patients who have signed such consent, you are expected to share their clinical information with the research team.

To facilitate e- learning, a computer and a modem will be provided in your health centre so that you can review material, download some of the learning materials to the desk top for you to read and be able to interact with other peers and your mentor. The e – learning will be free and the modem will have air time to help you download the e-learning materials and interact with your mentor and your peers in the program for the purpose of learning.

You will be assessed by peers, mentors and through Objective knowledge assessment, which will be through quizzes given throughout the course, with a final multiple choice exam at the end of the course. The content of the final exam will be directly from the learning materials that you will be asked to study for each competency.

To ensure that your work load is not increased, very simple instruments for assessing the problems will be used and you will be assisted by a community health worker to do the initial screening.

Benefits:

This study will help you to interact with other professions as you learn, getting a mentor and getting information on Substance Use Disorders. You will have improved knowledge, skills and attitude in screening and intervening on substance use disorders and co-morbidities. At the end of the course you will get a certificate which will help you in your career progression.

Risks:

The only risks are probable increase in the work load as you will be asking the patients questions that you are not used to asking and you will need to dedicate some of your time to do the e-learning which you are not used to. The e-learning should take you about 2 hours in a week, plus some occasional peer- and mentored- activities. The other possible risk is perhaps a fear of not doing to your expectations in the assessments. However, you can take those assessments multiple times, and review the material as well as get more learning support from the team, until you are satisfied with your performance. The result of your assessment will be kept strictly confidential by the research team, and shared with others only if you specifically request us to do so for your own career progression benefit.

Voluntary Participation:

Your participation in the study is completely voluntary. You are therefore free not to participate in the study, withdraw participation any time without any loss of benefits from your employer.

Confidentiality:

Any information about you that should be kept private like your marks will be kept confidential.

Compensation

You will not be paid to participate in the training.

Additional Information:

If you have questions or you require any clarifications please feel free to ask me. In addition, if you have questions in the future you are also free to directly ask the **Principal Investigator** on 0728439553 or any of the following Supervisors: **Prof. Zipporah Ng'ang'a** (+254 722 794 883) – Jomo Kenyatta University of Agriculture and Technology, **Dr. Yeri Kombe** (+254 734 257 864) - Kenya Medical Research Institute, **Dr. Victoria Mutiso** (+254 –722 738 887) - Africa Mental Health Foundation.

You may also contact the **Secretary of the Kenya Medical Research Institute – Ethics Review Committee (KEMRI/ERC)** if you have any questions regarding this research study that you feel are best addressed by an independent party: The Secretary, KEMRI/ERC Tel 020-2722541, 0722 205 901, 0733 400 003; Email: ercadmin@kemri.org

CONSENT FORM FOR THE HEALTH WORKER

I, _____ have read the consent explanation on the study named "The Effect of Web-based Training in Prevention and Treatment of Substance Use Disorders (SUDs), on Structural Stigma among Healthcare workers in a Low Income Setting" I confirm that I was given the time to ask any questions and that all my questions were satisfactorily answered. On the basis of this, I therefore agree that I will participate in the study and that I reserve the right to withdraw that permission at any time without any loss of benefits.

Signature of the Health worker: _____

Date: _____

Witnessed by- Person Obtaining Consent

Name, please print: _____

Signature of witness: _____

Date: _____

NOTE: You are not giving up any of your legal rights by signing this informed consent document.

Appendix II : Questionnaire

SURVEY FOR HEALTH CARE WORKERS

Facility Name Facility CODE Serial Number Date_____/_____/_____

_____ _____

INSTRUCTIONS: ANSWER ALL QUESTIONS

SECTION 1: BASIC INFORMATION

1.1	How old are you? (Years)	
1.2	Indicate your sex	[1]Male [2] Female
1.3	What is your professional area?	[1] Doctor [2] Nurse [3] Clinical Officer [4] Community Health Worker [5] Other (Specify) _____
1.4	What are your professional qualifications?	1.4.1 Basic _____ 1.4.2 Post Basic (if any) _____
1.5	Which year did you achieve your basic qualification?	
1.6	For those with post-basic qualifications	1.7.1 Year attained _____ 1.7.2 Specialization _____
1.7	How many years have you worked since completing your basic qualification?	_____
1.8	If you are a student specify year of study and course you are taking?	
1.9.1	What is your religious preference?	[1] Christian [2] Muslim [3] Hindu [4] Buddhist [5] Other (Specify) _____
1.9.2	If you have a religious preference, How often do you attend religious meetings?	[1] Never [2] At least Once a month [3] At least Twice a month [4] At least Three times in a month [5] I hardly ever miss a service

1.10	Do you own (circle all that apply)?	1. Mobile phone 2. Computer 3. Modem for online communication 4. Car 5. Motorbike 6. Bicycle
1.11	Marital Status	1. Single 2. Cohabiting 3. Married 4. Divorced or separated 5. Widow or widower
1.13	Do you have a source of income?	Yes or No, if yes is it (circle and specify)? 1. Full time; position: 2. Par-time: position: 3. Running a personal business yes or no, if yes what business? 4. Other (specify) _____
1.14	How long have you been using a computer?	□ Less than 3 months □ 3 months to a year □ 1–3 years □ 4–5 years □ More than 6 years

SECTION 2.0 OPENING MINDS SCALE FOR HEALTH WORKERS

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. I am more comfortable helping a person who has a physical illness than I am helping a person who has _____ use disorder.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
2. If a person with _____ use disorder complains of physical symptoms (e.g., nausea, back pain or headache), I would likely attribute this to their alcohol use disorder.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
3. If a colleague with whom I work told me they had a managed _____use disorder, I would be just as willing to work with him/her.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
4. If I were under treatment for _____ use disorder I would not disclose this to any of my colleagues.					

a) alcohol					
b) tobacco					
c) other substance (drugs)					
5. I would be more inclined to seek help for _____ use disorder if my treating healthcare provider was not associated with my workplace.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
6. I would see myself as weak if I had _____use disorder and could not fix it myself.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
7. I would be reluctant to seek help if I had _____ use disorder.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
8. Employers should hire a person with a managed _____ use disorder if he/she is the best person for the job.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
9. I would still go to a physician if I knew that the physician had been treated for _____ use disorder.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
10. If I had _____use disorder, I would tell my friends.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
11. It is the responsibility of health care providers to inspire hope in people with _____ use disorder.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
12. Despite my professional beliefs, I have negative reactions towards people who have _____ use disorder.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
13. There is little I can do to help people with _____ use disorder.					
a) alcohol					
b) tobacco					

c) other substance (drugs)					
14. More than half of people with _____ use disorder don't try hard enough to get better.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
15. People with _____ use disorder seldom pose a risk to the public.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
16. The best treatment for alcohol use disorder is medication.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
17. I would not want a person with _____use disorder, even if it were appropriately managed, to work with children.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
18. Healthcare providers do not need to be advocates for people with _____use disorder.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
19. I would not mind if a person with _____use disorder lived next door to me.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					
20. I struggle to feel compassion for a person with _____disorder.					
a) alcohol					
b) tobacco					
c) other substance (drugs)					

SECTION 3.0 ALCOHOL USE DISORDERS IN PRACTICE

3.1 In your own estimation, <u>out of every 100 patients</u> that you see how many do you think: (<u>Answer each of the following</u>)

[1]	Are predominantly alcohol use disorder cases?	
[2]	Have a significant alcohol use component in addition to the physical condition?	
[3]	Have a mild alcohol use component in addition to the physical condition?	

[4] Have no alcohol use component at all?	
3.2 Do you have access to a Mental Health Worker in case you need to refer alcohol use cases?	[1] Yes [2] No
3.2.1 If yes, are they in	[1] Public institutions [2] Private institutions [3] Both [4] Other (specify) _____
3.3 How comfortable are you in managing patients with alcohol use disorders?	[1] Very Comfortable [2] Comfortable [3] A little bit comfortable [4] Not comfortable at all
3.4 Is there a need for alcohol use component in the training of professionals in your field?	[1] Yes [2] No
3.4.1 If yes, at what level?	[1] College/ Undergraduate [2] Post-graduate [3] Other (Specify)
3.5 Have you had a chance to attend a refresher course in alcohol use treatment and prevention?	[1] Yes [2] No
3.6 If you had a chance for refresher course of alcohol use treatment and prevention would you consider taking it?	[1] Yes [2] No
3.6.1 If Yes, why?	[1] It is relevant to what I see in my work [2] It will be an added qualification [3] It's a way to get time off [4] Other (Specify) _____
3.6.2 If No, why not?	[1] No time due to busy schedule [2] Not interested [3] It's a waste of time [4] Other (Specify) _____
3.7.2 Non-psychiatrists have an important role to play	[1] Yes [2] No
SECTION 4.0 SUBSTANCE USE DISORDER IN PRACTICE	
4.1 In your own estimation, out of every 100 patients that you see how many do you think: (Answer each of the following)	
[1] Are predominantly substance use disorder cases?	
[2] Have a significant substance use component in addition to the physical condition?	

[3] Have a mild substance use component in addition to the physical condition?	
[4] Have no substance use component at all?	
4.2 Do you have access to a Mental Health Worker in case you need to refer substance use cases?	[1] Yes [2] No
4.2.1 If yes, are they in	[1] Public institutions [2] Private institutions [3] Both [4] Other (specify) _____
4.3 How comfortable are you in managing patients with substance use disorders?	[1] Very Comfortable [2] Comfortable [3] A little bit comfortable [4] Not comfortable at all
4.4 Is there a need for substance use component in the training of professionals in your field?	[1] Yes [2] No
4.4.1 If yes, at what level?	[1] College/ Undergraduate [2] Post-graduate [3] Other (Specify)
4.5 Have you had a chance to attend a refresher course in substance use treatment and prevention?	[1] Yes [2] No
4.6 If you had a chance for refresher course of substance use treatment and prevention would you consider taking it?	[1] Yes [2] No
4.6.1 If Yes, why?	[1] It is relevant to what I see in my work [2] It will be an added qualification [3] It's a way to get time off [4] Other (Specify) _____
4.6.2 If No, why not?	[1] No time due to busy schedule [2] Not interested [3] It's a waste of time [4] Other (Specify) _____
4.7 Non-psychiatrists have an important role to play	[1] Yes [2] No
SECTION 5.0 TOBACCO USE DISORDERS IN PRACTICE	
5.1 In your own estimation, **out of every 100 patients** that you see how many do you think: (**Answer each of the following**)	

[1] Are predominantly tobacco use disorder cases?	
[2] Have a significant tobacco use component in addition to the physical condition?	
[3] Have a mild tobacco use component in addition to the physical condition?	
[4] Have no tobacco use component at all?	
5.2 Do you have access to a Mental Health Worker in case you need to refer tobacco use cases?	[1] Yes [2] No
5.2.1 If yes, are they in	[1] Public institutions [2] Private institutions [3] Both [4] Other (specify) _____
5.3 How comfortable are you in managing patients with tobacco use disorders?	[1] Very Comfortable [2] Comfortable [3] A little bit comfortable [4] Not comfortable at all
5.4 Is there a need for tobacco use component in the training of professionals in your field?	[1] Yes [2] No
5.4.1 If yes, at what level?	[1] College/ Undergraduate [2] Post-graduate [3] Other (Specify)
5.5 Have you had a chance to attend a refresher course in tobacco use treatment and prevention?	[1] Yes [2] No
5.6 If you had a chance for refresher course of tobacco use treatment and prevention would you consider taking it?	[1] Yes [2] No
5.6.1 If Yes, why?	[1] It is relevant to what I see in my work [2] It will be an added qualification [3] It's a way to get time off [4] Other (Specify) _____
5.6.2 If No, why not?	[1] No time due to busy schedule [2] Not interested [3] It's a waste of time [4] Other (Specify) _____
5.7 Non-psychiatrists have an important role to play	[1] Yes [2] No

SECTION 6: THE ALCOHOL, SMOKING AND SUBSTANCE INVOLVEMENT SCREENING TEST (ASSIST)

1. In your life, which of the following substances have you ever used?	0=No	1 = Yes
(a) Tobacco products (cigarettes, chewing tobacco, cigars, etc.)		
(b) Alcoholic beverages (beer, wine, spirits, changaa, (kumikumi.)		
(c) Caffeine		
(d) Cannabis (marijuana, pot, grass, hash, bhang)		
(e) Cocaine (coke, crack, etc.)		
(f) Amphetamine type stimulants (speed, diet pills, ecstasy, Khat/Miraa)		
(g) Inhalants (nitrous, glue, petrol, paint thinner, etc.)		
(h) Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol,)		
(i) Hallucinogens (LSD, acid, mushrooms, PCP, Special K,)		
(j) Opioids (heroin, morphine, codeine, Brown sugar)		

For Q2 – Q5 tick one of the following:
0=Never 1=once or twice 2=Monthly 3=Weekly 4=Daily or almost daily

2. In the past 3 months, how often have you used the substances you mentioned?	0	1	2	3	4
(a) Tobacco products (cigarettes, chewing tobacco, cigars, etc.)					
(b) Alcoholic beverages (beer, wine, spirits, changaa, (kumikumi.)					
(c) Caffeine					
(d) Cannabis (marijuana, pot, grass, hash, bhang)					
(e) Cocaine (coke, crack, etc.)					
(f) Amphetamine type stimulants (speed, diet pills, ecstasy, Khat/Miraa)					
(g) Inhalants (nitrous, glue, petrol, paint thinner, etc.)					
(h) Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol,)					
(i) Hallucinogens (LSD, acid, mushrooms, PCP, Special K,)					
(j) Opioids (heroin, morphine, codeine, Brown sugar)					
3. During the past 3 months, substance you have mentioned in Q1 how often have you had a strong desire or urge to use them?	0	1	2	3	4
(a) Tobacco products (cigarettes, chewing tobacco, cigars, etc.)					
(b) Alcoholic beverages (beer, wine, spirits, changaa, (kumikumi.)					
(c) Caffeine					
(d) Cannabis (marijuana, pot, grass, hash, bhang)					
(e) Cocaine (coke, crack, etc.)					
(f) Amphetamine type stimulants (speed, diet pills, ecstasy, Khat/Miraa)					
(g) Inhalants (nitrous, glue, petrol, paint thinner, etc.)					

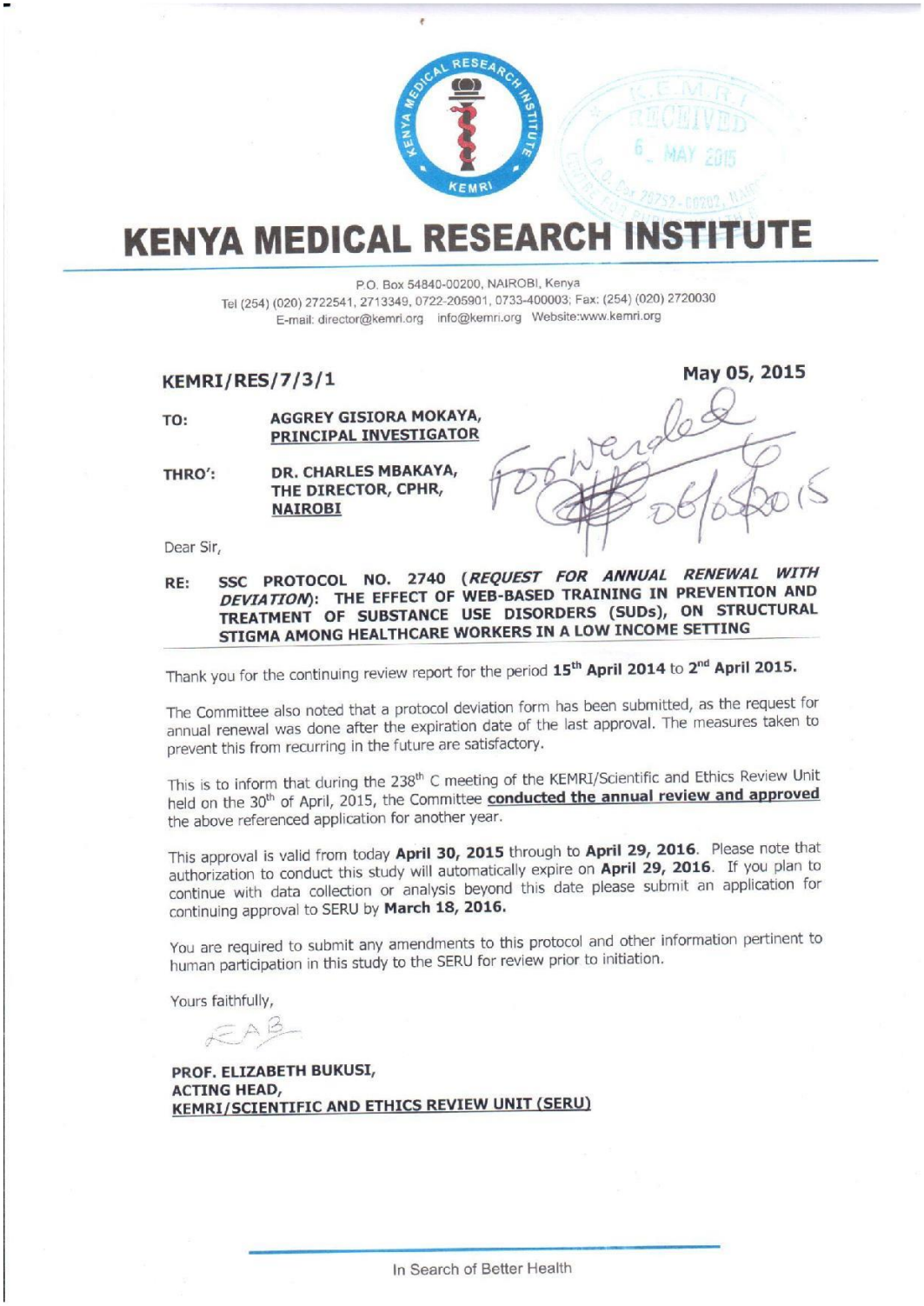
(h) Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol,)					
(i) Hallucinogens (LSD, acid, mushrooms, PCP, Special K,)					
(j) Opioids (heroin, morphine, codeine, Brown sugar)					
4. During the past 3months, how often has your use of drugs mentioned in question Q1 led to health, and social, legal or financial problems?	0	1	2	3	4
(a) Tobacco products (cigarettes, chewing tobacco, cigars, etc.)					
(b) Alcoholic beverages (beer, wine, spirits, changaa, (kumikumi.)					
(c) Caffeine					
(d) Cannabis (marijuana, pot, grass, hash, bhang)					
(e) Cocaine (coke, crack, etc.)					
(f) Amphetamine type stimulants (speed, diet pills, ecstasy, Khat/Miraa)					
(g) Inhalants (nitrous, glue, petrol, paint thinner, etc.)					
(h) Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol,)					
(i) Hallucinogens (LSD, acid, mushrooms, PCP, Special K,)					
(j) Opioids (heroin, morphine, codeine, Brown sugar)					
5. During the past 3 months, how often have you failed to do what was normallyexpected of you because of your use of:	0	1	2	3	4
(a) Tobacco products (cigarettes, chewing tobacco, cigars, etc.)					
(b) Alcoholic beverages (beer, wine, spirits, changaa, (kumikumi.)					
(c) Caffeine					
(d) Cannabis (marijuana, pot, grass, hash, bhang)					
(e) Cocaine (coke, crack, etc.)					
(f) Amphetamine type stimulants (speed, diet pills, ecstasy, Khat/Miraa)					
(g) Inhalants (nitrous, glue, petrol, paint thinner, etc.)					
(h) Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol,)					
(i) Hallucinogens (LSD, acid, mushrooms, PCP, Special K,)					
(j) Opioids (heroin, morphine, codeine, Brown sugar)					

For Q6-Q8 Tick 0=No, never, 1=Yes, but not in the past 3 months, or 2=Yes in the past 3months

6. Has a friend or relative or anyone else ever expressed concern about your use of drug	0	1	2
(a) Tobacco products (cigarettes, chewing tobacco, cigars, etc.)			
(b) Alcoholic beverages (beer, wine, spirits, changaa, (kumikumi.)			
(c) Caffeine			
(d) Cannabis (marijuana, pot, grass, hash, bhang)			
(e) Cocaine (coke, crack, etc.)			
(f) Amphetamine type stimulants (speed, diet pills, ecstasy, Khat/Miraa)			

(g) Inhalants (nitrous, glue, petrol, paint thinner, etc.)			
(h) Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol,)			
(i) Hallucinogens (LSD, acid, mushrooms, PCP, Special K,)			
(j) Opioids (heroin, morphine, codeine, Brown sugar)			
7. Have you ever tried to control, cut down or stop using drug	0	1	2
(a) Tobacco products (cigarettes, chewing tobacco, cigars, etc.)			
(b) Alcoholic beverages (beer, wine, spirits, changaa, (kumikumi.)			
(c) Caffeine			
(d) Cannabis (marijuana, pot, grass, hash, bhang)			
(e) Cocaine (coke, crack, etc.)			
(f) Amphetamine type stimulants (speed, diet pills, ecstasy, Khat/Miraa)			
(g) Inhalants (nitrous, glue, petrol, paint thinner, etc.)			
(h) Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol,)			
(i) Hallucinogens (LSD, acid, mushrooms, PCP, Special K,)			
(j) Opioids (heroin, morphine, codeine, Brown sugar)			
8. Have you ever used any drug by injection?	0=No	1 = Yes	

Appendix III : Ethical Approval Letters



KENYA MEDICAL RESEARCH INSTITUTE

P.O. Box 54840-00200, NAIROBI, Kenya
Tel (254) (020) 2722541, 2713349, 0722-205901, 0733-400003; Fax: (254) (020) 2720030
E-mail: director@kemri.org info@kemri.org Website:www.kemri.org

KEMRI/RES/7/3/1

May 05, 2015

TO: **AGGREY GISIORA MOKAYA, PRINCIPAL INVESTIGATOR**

THRO': **DR. CHARLES MBAKAYA, THE DIRECTOR, CPHR, NAIROBI**

Forwarded 06/05/2015

Dear Sir,

RE: **SSC PROTOCOL NO. 2740 (*REQUEST FOR ANNUAL RENEWAL WITH DEVIATION*): THE EFFECT OF WEB-BASED TRAINING IN PREVENTION AND TREATMENT OF SUBSTANCE USE DISORDERS (SUDs), ON STRUCTURAL STIGMA AMONG HEALTHCARE WORKERS IN A LOW INCOME SETTING**

Thank you for the continuing review report for the period **15th April 2014** to **2nd April 2015.**

The Committee also noted that a protocol deviation form has been submitted, as the request for annual renewal was done after the expiration date of the last approval. The measures taken to prevent this from recurring in the future are satisfactory.

This is to inform that during the 238th C meeting of the KEMRI/Scientific and Ethics Review Unit held on the 30th of April, 2015, the Committee **conducted the annual review and approved** the above referenced application for another year.

This approval is valid from today **April 30, 2015** through to **April 29, 2016**. Please note that authorization to conduct this study will automatically expire on **April 29, 2016**. If you plan to continue with data collection or analysis beyond this date please submit an application for continuing approval to SERU by **March 18, 2016.**

You are required to submit any amendments to this protocol and other information pertinent to human participation in this study to the SERU for review prior to initiation.

Yours faithfully,

EAB

PROF. ELIZABETH BUKUSI,
ACTING HEAD,
KEMRI/SCIENTIFIC AND ETHICS REVIEW UNIT (SERU)

In Search of Better Health

KENYA MEDICAL RESEARCH INSTITUTE

P.O. Box 54840-00200, NAIROBI, Kenya
Tel (254) (020) 2722541, 2713349, 0722-205901, 0733-400003; Fax: (254) (020) 2720030
E-mail: director@kemri.org info@kemri.org Website:www.kemri.org

K.E.M.R.I RECEIVED 28 JAN 2014 P.O. Box 20752-00202, NAIROBI. CENTRE FOR PUBLIC HEALTH RESEARCH

KEMRI/SSC/102468 **28th January, 2014**

Aggrey Mokaya

Thro'
Director, CPHR
NAIROBI

Forwarded to 28/01/2014

REF: SSC No. 2740 (Revised) – The Effect of Web-Based Training in Prevention and Treatment of Substance Use Disorders (SUDS), on Structural Stigma among Healthcare Workers in a Low Income Setting

I am pleased to inform you that the above mentioned proposal, in which you are the PI, was discussed by the KEMRI Scientific Steering Committee (SSC), during its **210th** meeting held on **6th January, 2014** and has since been approved for implementation by the SSC.

Kindly submit 4 copies of the amended protocol to SSC within 2 weeks from the date of this letter i.e., 11th February, 2014 for onward transmission to the ERC office.

We advise that work on this project can only start when ERC approval is received.

Sammy Njenga, PhD
SECRETARY, SSC

In Search of Better Health

KENYA MEDICAL RESEARCH INSTITUTE

P.O. Box 54840-00200, NAIROBI, Kenya
Tel (254) (020) 2722541, 2713349, 0722-205901, 0733-400003; Fax: (254) (020) 2720030
E-mail: director@kemri.org info@kemri.org Website:www.kemri.org

KEMRI/RES/7/3/1 **April 15, 2014**

TO: **AGGREY GISIORA MOKAYA**
PRINCIPAL INVESTIGATOR

THROUGH: **DR. CHARLES MBAKAYA,**
ACTING DIRECTOR, CPHR,
NAIROBI

Forwarded
22/04/2014

Dear Sir,

RE: SSC PROTOCOL NO. 2740 (*RESUBMISSION*): THE EFFECTS OF WEB-BASED TRAINING IN PREVENTION AND TREATMENT OF SUBSTANCE USE DISORDERS (SUDs), ON STRUCTURAL STIGMA AMONG HEALTHCARE WORKERS IN A LOW INCOME SETTING

Reference is made to your letter dated 8th April, 2014. The ERC Secretariat acknowledges receipt of the revised study protocol on April 9, 2014.

This is to inform you that the Ethics Review Committee (ERC) reviewed the documents submitted and is satisfied that the issues raised at the 225th meeting of the KEMRI ERC on 18th March 2014 have been adequately addressed.

The study is granted approval for implementation effective this **15th April, 2014**. Please note that authorization to conduct this study will automatically expire on **April 14, 2015.** If you plan to continue with data collection or analysis beyond this date, please submit an application for continuing approval to the ERC Secretariat by **March 3, 2015**.

Any unanticipated problems resulting from the implementation of this protocol should be brought to the attention of the ERC. You are also required to submit any proposed changes to this protocol to the SSC and ERC prior to initiation and advise the ERC when the study is completed or discontinued.

You may embark on the study.

Yours faithfully,

EAB

DR. ELIZABETH BUKUSI,
ACTING SECRETARY,
KEMRI/ETHICS REVIEW COMMITTEE

KENYA MEDICAL RESEARCH INSTITUTE

P.O. Box 54840-00200, NAIROBI, Kenya
Tel (254) (020) 2722541, 2713349, 0722-205901, 0733-400003; Fax: (254) (020) 2720030
E-mail: director@kemri.org info@kemri.org Website:www.kemri.org

KEMRI/SSC/102948 10th July, 2014

Aggrey Mokaya

Thro'
Ag. Director, CPHR
NAIROBI

Forwarded 16/07/2014

REF: SSC No.2740 (Amendment) – The effect of web-based training on prevention and treatment of substance use disorders (SUDs) on structural stigma among health care workers in a low-income setting

This is to inform you that the above-mentioned protocol amendment was discussed during the **216th SSC Meeting** held on **8th July, 2014** and the Committee noted the following amendments:

1. Addition of one private facility: Shalom Hospital, Athi River as a study site.
2. Addition of one public facility: Kibwezi Sub-county Hospital, Makueni County as a study site.

The Committee considered the above amendments adequately justified and has since **approved** them for implementation.

Kindly submit 4 copies of the amended protocol to SSC within 2 weeks from the date of this letter i.e., 24th July, 2014 for onward transmission to the ERC.

We advise that work on this project can only start when ERC approval is received.

Sammy Njenga, PhD
SECRETARY, SSC

K.E.M.R.I RECEIVED 15 JUL 2014 P.O. Box 20752-00202, NAIROBI CENTRE FOR PUBLIC HEALTH RESEARCH

15

KENYA MEDICAL RESEARCH INSTITUTE

P.O. Box 54840-00200, NAIROBI, Kenya
Tel (254) (020) 2722541, 2713349, 0722-205901, 0733-400003; Fax: (254) (020) 2720030
E-mail: director@kemri.org info@kemri.org Website:www.kemri.org

KEMRI/RES/7/3/1 **August 27, 2014**

TO: **AGGREY MOKAYA (PRINCIPAL INVESTIGATOR)**

THROUGH: **DR. CHARLES MBAKAYA,**
ACTING DIRECTOR, CPHR,
NAIROBI

Forwarded 15/09/2014

Dear Sir,

RE: **SSC PROTOCOL No. 2740 - (*1ST AMENDMENT*): THE EFFECT OF WEB-BASED TRAINING IN PREVENTION AND TREATMENT OF SUBSTANCE USE DISORDERS (SUDs) ON STRUCTURAL STIGMA AMONG HEALTHCARE WORKERS IN A LOW INCOME SETTING**

This is to inform you that during the 230th meeting of the KEMRI/ERC meeting held on August 19, 2014, the requested amendments for the above referenced study was reviewed.

The Committee noted the following amendments:

a) Addition of one private facility, Shalom Hospital, Athi River, as a study site: This has been necessitated by closure of two of the private clinics that had initially been selected for the study i.e. CliniX Central Workshop and CliniX Haile Selassie.

b) Addition of one public facility in Makueni County, Kibwezi sub county Hospital, as a study site. Following redeployment of staff by the County government of Makueni, 3 of the 5 facilities that had initially been selected in makueni county i.e. Kaunguni Dispensary, Kalii Health Centre and Kiboko Health Centre are facing staff shortages and as a result of this it will not be possible to achieve the desired sample size for the study.

The Committee concluded that the suggested amendments are justified and do not alter the substance of the study therefore granted approval for implementation.

Appendix IV: Proof of Publication

Journal of Psychoactive Drugs

ISSN: 0279-1072 (Print) 2159-9777 (Online) Journal homepage: http://www.tandfonline.com/loi/ujpd20

Substance Use among a Sample of Healthcare Workers in Kenya: A Cross-Sectional Study

Aggrey G. Mokaya B.Sc., PGDip., Victoria Mutiso B.A., M.Sc., Ph.D., Abednego Musau M.B.Ch.B., M.P.H., Albert Tele B.Sc., M.Sc, Yeri Kombe M.B.Ch.B., M.P.H., Ph.D., Zipporah Ng'ang'a B.Sc., M.Sc., Ph.D., Erica Frank M.D., M.P.H., David M. Ndetei M.B.Ch.B., D.P.M., M.R.C.Psych., F.R.C.Psych., M.D., D.Sc. & Veronic Clair M.D., M.Sc., C.C.F.P., F.R.C.P.C., Ph.D.

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