

PREVENTION OF ALCOHOL AND SUBSTANCE ABUSE:
mHEALTH BASED PEER-MENTORING AMONG STUDENTS

AT THE UNIVERSITY OF NAIROBI

A DISSERTATION FOR THE AWARD OF THE DOCTORATE OF
PHILOSOPHY IN CLINICAL PSYCHOLOGY

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October 16, 2021

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I CATHERINE MAWIA MUSYOKA do hereby declare that this dissertation is my original work and that it was carried out in fulfilment of the requirement for the award of the degree of Doctor of Philosophy in Clinical Psychology of the University of Nairobi.

This work was supervised by Professor Muthoni Mathai and Dr Anne Mbwayo of the Department of Psychiatry, School of medicine, University of Nairobi.

I further declare that this dissertation has not been presented for the award of a degree at any other University and that I have acknowledged through references, all the sources of the information I have used.

Two manuscripts have been published from this thesis so far, namely,

1. mHealth-based peer mentoring for prevention of alcohol and substance abuse among first-year university students: protocol for quasi-experimental intervention, Journal of Substance Use, DOI: 10.1080/14659891.2020.1766131
2. Alcohol and substance use among first-year students at the University of Nairobi, Kenya: Prevalence and patterns. PLoS ONE 15(8): e0238170. <https://doi.org/10.1371/journal.pone.0238170>

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APPROVAL

This is to certify that the student, Catherine Mawia Musyoka, carried out this work independently, under the supervision of the University of Nairobi appointed supervisors, Prof. Muthoni Mathai and Dr Anne Mbwayo. The research was approved by the Department of Psychiatry on behalf of the university. It was submitted to the joint committee of the Kenyatta National Hospital and the University of Nairobi Ethics and Review Board for ethical approval.

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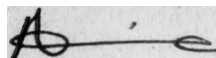
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DEDICATION

I dedicate this work to all my family members especially my late father Mr Julius Musyoka Kisallu, who urged me to study to the highest level possible, long before I could envisage it myself. My parents' life of hard work and sacrifice allowed me to succeed in my endeavours. To my husband Dr Maurice Kalande Amulundu you deserve an honorary PhD for your priceless support. Finally, to my children, Jimmy, Michelle, Maya, Cheryl and Geremi, my number one cheering squad, your moral support was ever assured. I appreciate your unflagging support and encouragement. May God bless you all

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ABBREVIATIONS AND ACRONYMS

AIDS- Acquired Immune Deficiency Syndrome

BBBS -Big Brother Big Sister Program

CDI- Computer-Delivered Interventions

CEES -College of Education and External Studies

FTFI- Face to Face Intervention

FYE -First-Year Experience

HIV- Human Immunodeficiency Virus

KAP-Knowledge, Attitude, and Practice

NACADA-National Agency for the Campaign Against Substance Abuse

ODK- Open Data Kit

PI- Principal Investigator

PMTCT- Prevention of Mother to Child Transmission

PRATAM- Perceived Resources and Technology Acceptance Model

REAIM- Reach, Efficiency, Adoption, Implementation, and Maintenance

TAM- Technology Acceptability Model

TB- Tuberculosis

UON – University of Nairobi

UNODC –United Nations Office for Drugs and Crime

USA-United States of America

WDR-World Drug Report

DEFINITION OF TERMS

Acceptability: Perception among stakeholders that innovation or service is agreeable, palatable, and satisfactory.

Addiction counsellor: An accredited lay counsellor who has demonstrated proficiency in core addiction counselling competencies and has been duly accredited and registered by a recognized training and registration body.

Alcohol and substance abuse: A recurrent and maladaptive pattern of use of alcohol and drugs that causes adverse social, psychological, occupational or physiological consequences

Alcohol: An intoxicating agent in beverages derived from ethanol, ethyl or closely related hydrocarbon compounds, or any other low molecular weight substance.

Appropriateness: The perceived fit, relevance, or compatibility of the innovation or evidence-based practice for a given practice setting, provider, or consumer; and/or perceived fit of the innovation to address a particular issue or problem.

ATS: Amphetamine-Type Stimulants are a group of synthetic drugs created by processing chemical ingredients, the principal members include amphetamine and methamphetamine.

Counsellors: Professionals who help clients identify their goals and potential solutions to their problems that cause emotional distress.

Dependence or Addiction: A state arising from a repeated administration of a drug on a periodic or continuous basis resulting in psychological or physical reliance

Drug: A chemical substance that produces a physical, mental, emotional or behavioural change in a user (“drug” is synonymous with “substance” in this study)

e-Health: Electronic Health refers to the support of healthcare practices and behaviour modification strategies delivered via electronic devices, such as mobile phones, smartphones, patient monitoring devices, personal digital assistants (PDAs) and laptop computers.

Empathy: Awareness of the feelings and emotions of other people.

Feasibility: The extent to which a new treatment, or an innovation, can be successfully used or carried out within a given agency or setting

Helping skills: Abilities possessed by a relevantly trained accredited/ professional staff member that enables him/her to offer therapeutic intervention, support, and guidance.

Illegal drug: A substance or derivative thereof the same which is regulated or not sanctioned by any law; any substance such as a prescription used for any reason other than a legitimate medical purpose and inhalants prohibited by law such as marijuana or cannabis in all its forms.

Knowledge: The general conscious awareness of the thinking strategies used during instruction.

Mentee: A person being guided or advised by a mentor.

Mentorship: Supportive relationship in which one person offers support, guidance and concrete assistance to the partner, based on the sharing of experience and expertise without expectation of personal gain by the mentor.

mHealth: The use of mobile phone and wireless technologies to support the achievement of health objectives, interventions and research and for healthcare delivery public health.

Peer mentoring is a relationship between people who are at the same career stage or age, in which one person has more experience than the other in a particular domain and can provide

support as well as knowledge and skills transfer. Peer mentoring may be a one-on-one relationship or experienced in a group.

In this study, peer mentors were a group of students who were trained by the principal investigator to promote mental health awareness, identify and assist students with psychological needs or substance use problems and build a caring culture among students on campus.

Prevention: Any activity that is (at least partially) aimed at averting, delaying or reducing drug use, and/or its negative consequences in the general population or subpopulations.

Substance abuse: The misuse or overuse of a substance; using a substance in a way different from the way it is generally used either medically or socially; using any illegal substance (including alcohol when one is not of legal age); continued use of a substance even though it is causing problems in one's life.

Harm reduction: The prevention of adverse consequences of illicit drug use without necessarily reducing their consumption.

Abstract

Background: The use of alcohol and substance abuse is rising in Kenyan institutions of higher learning. The University of Nairobi trains peer-mentors to reach out to and counsel students on the effects of and prevention of substance use while in college. There is, however, an inadequate implementation and evaluation system for this method. This study introduced a mHealth-based tool to the practice of peer mentoring to assist peer mentors in decision making while undertaking their duties. The use of mHealth-based tools also enabled the provision of real-time feedback of the peer-mentoring processes, therefore, facilitating better support-supervision and overall implementation evaluation of the Alcohol and Drug Abuse prevention program at a university-wide level.

Study Objective: To design a mHealth-based decision support tool for peer-mentoring and apply it to students at the University of Nairobi.

Methodology: The study was in three phases. Phase one was a baseline survey. Phase two was to design the mHealth tool prototype and implement it and in phase three we had focus group discussions with peer mentors for purposes of the mHealth tool evaluation. In the first phase, a cross-sectional baseline survey determined students' attitudes toward, and prevalence of substance use/abuse. Using population proportion sampling we recruited 406 study respondents. Data collection used World Health Organization (WHO) standardized tools for alcohol and substance use screening. In the second phase, we designed a mHealth-based prototype based on Open Data Kit (ODK) technology and then implemented the tool on two university campuses using a quasi-experimental study design. The participants were a total of 100 mentors, 51 in the mHealth group and 49 in the control group. They were selected purposively from two geographically separated University of Nairobi (UoN) campuses.

One campus had an experimental group of peer mentors. These mentors used mHealth-based decision support tool for intervention in peer mentoring to screen for substance use, provide structured brief intervention and treatment referral. The other campus had the comparative control group which used the standard UoN practice of using a paper-based tool to deliver the same program. Both groups were followed up for 6 months with support supervision meetings held twice per month. In phase three of the study, a qualitative assessment of the second phase was done whereby mentors during focussed group discussions shared their experiences of the peer mentoring process. We had four groups of eight to ten peer mentors. These groups were randomly selected from the pool of peer mentors on both campuses.

mHealth ODK-based prototype: The mHealth-based peer mentoring prototype was built using the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) and Alcohol Use Disorder Identification Test (AUDIT) which are WHO approved tools for substance use disorders screening in the general population. Various ODK system features including, Select, Integer, and Calculate were used to design and program the mHealth-based decision support for substance use screening, intervention and referral tool. The peer mentor assessed their mentee's alcohol and substance use based on screen-by-screen questions that were programmed in the mHealth-based peer mentoring app. The mHealth-based peer mentoring app had inbuilt algorithms that were programmed to calculate the student's specific alcohol and substance use scores, these scores then determined the pathway for care. Possible programmed intervention options included information dissemination, basic brief therapeutic intervention, referral and linkage to care and support as well as follow-up sessions.

Data Analysis: Statistical software STATA was used for descriptive and inferential data analysis. Thematic content analysis was done for qualitative data using Nvivo.

Results: At baseline KAP survey, a total of 406 study respondents consented to participate in the study. The socio-demographic characteristics of the participants indicated that just over half (222/406, 54.7%) of the respondents were registered for courses on the Chiromo campus. By sex, approximately half of the respondents 206/406 (50.7%) were male. The mean age of all respondents was 19.3 ± 1.2 years. The majority (371/406 (93.7%)), were public sponsored and 318/406 (78.5%) resided on campus at university hostels.

The prevalence of lifetime and current psychoactive substances use was 103/406 (25%) and 83/406 (20%) respectively. Frequently used substances were alcohol 69/406 (22%), cannabis 33/406 (8%) and tobacco 28/406 (7%). Multiple substance use was reported by 48/406 (13%) respondents, the main combinations being cannabis, tobacco and alcohol.

Students living in private hostels were four times more likely to be current substance users compared with those living on campus (OR = 4.7, 95% CI: 2.0, 10.9). As pertains respondents' attitude towards alcohol and substance use, results indicated that 160/406 (39.41%) had a positive attitude to alcohol and substance use. Factors influencing the attitudes towards alcohol and substance use at the bivariate level showed that those on government sponsorship were more likely to have a positive attitude (41%) compared to the self-sponsored (23%).

The odds of having a positive attitude towards alcohol among those on self-sponsorship was 0.34 times that of those on government sponsorship (p-value=0.034). For those who reported lifetime use of substances their odds of having a positive attitude was 0.22 times that of those who had no lifetime substance use (p-value=0.042).

Results of program acceptability among peer mentors recorded the maximum score of 100% in the experimental group who used mHealth-based peer mentoring intervention. On the other hand, 96% of the peer mentors who used the standard practice mentoring reported satisfaction

with their tool. The practice of peer mentoring was approved by peer mentors in both groups who indicated that the program was appropriate with 98% of peer mentors from the mHealth-based experimental group and 100% of those from the control group had a positive attitude towards peer mentoring. However, on the actual use of the intervention, 100% of the peer mentors on the mHealth-based intervention cohort used their tool to completion while 25% of the standard practice group used their peer mentoring intervention tool to completion. The peer mentors who used the mHealth-based tool for peer mentoring reached 4 mentees for every 1 reached by the standard practice group because they found the mHealth tool speeding up their work more than the standard tool.

The peer mentors in the standard practice group cited task execution, data storage and retrieval challenges as the reasons for the lower usage of their tool while the mHealth-based group cited the ease of flow and decision making as being key to their success.

Over 400 mentees were reached by the mHealth-based cohort while 100 mentees were reached by the standard practice intervention group of peer mentors.

Focused group discussions were conducted and results were classified under these themes, *'experiences of peer mentors, opportunities for personal growth and challenges and recommendations'*. On the theme of *experiences of peer mentors*, the majority (90%) of the peer mentors reported that peer mentoring was a good and interesting experience for them. They appreciated the partnership of their fellow peer mentors in the mentoring process. They reported that the knowledge they gained helped them during informal interactions.

They also reported that the peer mentoring experience had opened opportunities for personal growth and development, as well as improvement in interpersonal and communication skills

among other benefits. Overall the peer mentors recommended that the peer mentoring process should continue and be implemented in other campuses.

Conclusion: Alcohol and substance use among students in the two University of Nairobi campuses is high, with one in every four first-year university students consuming alcohol and psychoactive substances by the time of admission to the university. Furthermore, about 40% of study respondents had a favourable attitude towards alcohol and substance use meaning they were likely to use substances in their lifetime. This scenario calls for remedial interventions to be instituted by the university from the time first-year students are admitted to reverse this trend.

mHealth-based peer mentoring program for the prevention of alcohol and substance use among university students was highly acceptable among the peer mentors. Over 90% of the peer mentors approved the mHealth-based tool over the standard tool.

The mHealth-based peer mentoring among university students was also reported by the peer mentors to be more acceptable among the students than the standard practice.

Overall, the results of this study provide evidence that young adults can be used as agents of change among their peers and that mHealth-based peer-led activities for the prevention of alcohol and psychoactive substance use are innovative ways to communicate behaviour change among college students.

Recommendation:

1. The use of the mHealth-based decision support tool for peer mentoring was highly accepted by university students and thus should be explored for roll-out on a large scale.

2. This study recommends that the use of mHealth-based peer mentoring programs for the prevention of alcohol and substance abuse be made the standard practice of care at the University of Nairobi and as well be disseminated to other universities in Kenya.
3. Peer mentors are agents of change and more should be trained and deployed by the universities to prevent alcohol and substance use and promote healthy social and academic behaviour among students
4. Universities should increase the available accommodation spaces on campus as this was found to be a protective factor against substance abuse by students.
5. Further studies should focus on the effectiveness of mHealth-based peer mentoring in reducing alcohol and substance abuse among university students.
6. Future research could seek to understand the reasons for the differences between the uptake of mHealth delivered peer mentoring as compared to the standard practice.

CHAPTER ONE

1.0 Introduction and Background

Alcohol and substance use is a global public health concern especially between the ages of 18 to 25 years which is reportedly the peak age for substance use (World Drug Report, 2018). This peak age is a time of important milestones in a person's life when the adolescents learn to take up adult responsibilities and experience the challenges of new roles, these are due to their mental immaturity (Skidmore et al., 2016). Psychologically, young adults are prone to thrill-seeking and practising risky behaviours which may lead to undesired consequences. This period also marks the transition from high school to college education, an exciting venture for young people, which comes along with new pressures and uncertainties, coupled with personal and social maladjustments (Ross et al., 2008; World Drug Report, 2018). At this age, college-bound students leave the comfort of their parents' homes to begin independent lives in new environments. They find themselves free from the controls of the structured high school schedules as well as the strict supervision of their parents. With their newfound freedom, many of them will party and test the limits of modesty by taking alcohol and illicit substances. They believe that substance use makes them appear mature and confident while for others, alcohol and substance use is an attempt to cope with the new pressures of higher education (Olashore et al., 2018). The early onset of substance use has been attributed to the aggressive advertisements of alcoholic drinks and psychoactive substances, poor skills to cope with stress, the wrong perception that other peers are engaged in alcohol and substance use and lack of cohesion in some families (Schall et al., 2015; White & Hingson, 2013).

Incidentally, the high school students who had started experimenting with alcohol and substances escalate their use once in college, this is also because alcohol and substance use is considered as a rite of passage by many college students.

The age of initiation to substance use has declined globally, from a mean age of 21 years in the mid-1980s to 10 years in 2012 (Nair et al., 2016; Ramsoomar et al., 2013). Most young adults start with the use of tobacco products and taking of alcohol which then usher them into the life of habitual substance use (Johnston, 2013, Nacada, 2014). Experimenting with alcohol, cannabis, and tobacco, starts in adolescence and peaks during young adulthood, at a time when the young adult get a new feeling of carefree attitude and freedom which are common at this stage of development (Botvin & Griffin, 2007). College Students are aged between 18 and 25 years, an age at which they are inclined to take risky choices including substance use (Lipari & Jean-Francois, 2013). Among the young adults, student substance use shows heavy episodic alcohol consumption and binge drinking (reported as a use of more than 5 standards drinks of alcohol at one sitting, a standard drink is approximately 8-20 grams of pure ethanol (Stockley et al., 2019)) when compared to other young adults who are not going to college, the incidence of alcohol and substance use in the population of college students is high (Eze & Uzoeghe, 2015; Makanjuola et al., 2014; Oliha, 2014).

There are worldwide consistent research findings that show a high prevalence of alcohol and substance use across countries. Globally, the non-medical use of prescription drugs is at epidemic proportions with Africa and Asia showing a soaring use of tramadol while North America is facing an opioid crisis (World Drug Report, 2018). In the United States of America (USA) the rate of alcohol and substance use is rising among those aged 18 to 25 years, there is also a reported increase of serious mental illness as well as a rise in suicidality in this age group

which are associated with alcohol and substance use (McCance-Katz, 2017). The trends indicate that there is rising substance use among females and this includes substances like cannabis, prescription drugs and alcohol (Organization of American States, 2019). The most used substances in America by those aged 18 to 25 years are alcohol, cannabis and opioids.

In this age group, 2.6 million people reported having used marijuana daily, while 10% (3.4 million) had developed disorders related to alcohol use (McCance-Katz, 2017). In Europe, an estimated 19.1 million young adults (aged 15-34) used substances in 2018 (European Monitoring Centre for Drugs, 2019). Cannabis is the most used substance in Europe and males used substances twice as much as females (European Monitoring Centre for Drugs, 2019).

In African studies conducted in Nigeria, Uganda, Ethiopia, Kenya and South Africa the prevalence of substance use ranged between 27.5% and 62%. The United Nations Office on Drugs and Crime (UNODC) 2018 report on substance use in Nigeria, puts the overall past-year prevalence of substance use at 14.3 million (14.4%). While the use of substances in Nigeria was reported across all age groups, the highest use was among the 25 to 39-year-olds. Cannabis was the most used substance with an average initiation age of 19 years. Amphetamines and ecstasy use among young people was also reported. Prescription opioids, mostly tramadol, morphine, and codeine were also in high use (United Nations Office on Drugs and Crime (UNODC), 2018). In Nigeria the most used substances are alcohol, codeine, tramadol and tobacco, furthermore, one university reported the prevalence of substance use among undergraduate students at 27.5% (Johnson et al., 2017).

The prevalence of alcohol and substance use among university students in Kenya ranges from 25% to 67.9% across 3 universities.

University students mostly reported the use of alcohol followed by cannabis and tobacco (Atwoli et al., 2011; Boitt, 2016; Ndegwa et al., 2017; Ngure et al., 2019).

Alcohol and substance use by college students has a legion of consequences ranging from physical and mental ill-health, accidents and physical and sexual assault and unplanned pregnancies (World Drug Report, 2018). Research shows that students who engage in alcohol and substance use have a negative effect on their academic commitments, they take longer to complete their studies and they are at greater risk to discontinue their studies (Ayalew et al., 2018; Ogbu & Akintoye, 2017). Long term consequences of alcohol and substance use include substance use disorders including addiction, increased risk of suicidality and homicide, dysfunctional social relationships, unemployment and thus poor economic outcomes, criminal behaviour and ultimately premature death (NIAAA, 2021; Ross et al., 2008).

Prevention and effective management of alcohol and substance use are key to saving university students from lifelong deleterious consequences of substance abuse and addiction. Schools and colleges use varying strategies to prevent substance use and problem behaviours among their students. These include strategies that focus on the individual students to educate them about the negative effects of substance use, while other strategies focus on environmental interventions like enforcing laws that prohibit alcohol and substance use within the university premises (Arria & Wagley, 2019; World Health Organization, 2000). A national study done in the USA on school-based drugs prevention showed that various prevention activities are available in many schools these preventive activities ranged from school rules and drugs prevention policies to deter underage drinking and the possession of substances or substance use, deterrence of engaging in other social problem behaviours to curriculum instructions on drug use prevention ((NREPP), 2015).

In Kenya, the standard approach that universities take is to sensitize and educate students about the risks of drinking alcohol and the use of psychoactive substances. Moreover, counselling services are available for the students who are already engaged in alcohol and substance use (Ngure et al., 2019). The use of students' peer mentors to model positive behaviour and campaign against alcohol and substance use is also practised in some universities.

Despite the efforts put in place to avail alcohol and substance use prevention programs, there is a rise in the consumption of alcohol and substance use among university students. Available data indicates that the number of students who have embraced counselling services in universities in Kenya is few (Ngure et al., 2019). This may be because students are sensitive about who they open up to about their life issues, there is also the fear that admitting that they have a problem with alcohol and substance use may lead to punitive actions from the university management. There is a need, therefore, to explore innovative strategies which will aid in effective communication of alcohol and substance use behaviour change to this group of students (Skidmore et al., 2016).

Effective communication between parents, other authority figures and students at this age is a challenge (Macarthur et al., 2016). However, at this age, young people interact and communicate with one another more freely than they do with adults, this may be because the young adults share interests and a strong belief system than when they grow older (Macarthur et al., 2016). The social influence model proposes that there are naturally occurring processes of information sharing between young people. This natural inclination explains the concepts of peer influence, peer pressure, and social norms (Goldsmith, 2015), which is why it is important to create the opportunity for peers to take the lead to deliver the interventions that are related to the promotion of healthy behaviours among the youth, this is also the basis of the peer mentoring approach.

The involvement of peers in behaviour change as well as in programs that are geared towards alcohol and substance use prevention is an emerging practice that is taking root. Peers have been used as mentors in programs that seek to control the spread of HIV/AIDS, here they serve as each other's support system and encourage each other to adhere to their prescribed medications, live positively and promote lifestyle modifications as evidenced by the 'Zvandiri' adolescent program in Zimbabwe (Grimsrud et al., 2020; WHO, 2019).

Peer-led interventions have been used successfully to encourage students to embrace physical activities (Jenkinson et al., 2012), programs using peers in substance use prevention interventions have also been successful in helping young adults to reduce their substance use (Mason et al., 2017; Tracy et al., 2012), peers have also being used to encourage and motivate young adults to stay in colleges and complete their studies (J. Andrews & Clark, 2011).

To reach and effectively communicate behaviour modification with young adults, the use of information technology and social media platforms such as the internet and smartphones offer promise for research, prevention, management of and recovery from alcohol and substance use disorders (Marsch, 2012). Electronic Health (eHealth) is the delivery of healthcare services through the use of electronic media like mobile phones. With over 80% of the world's population accessible to mobile phones (UIT, 2020), the use of mobile health (mHealth) which is a sub-set of eHealth to promote health behaviour modification and to enhance health through increased social opportunities for encouragement and support is a great opportunity (Hutton et al., 2020). University students are enthusiastic adopters of technology and have relatively high levels of mobile phone ownership and internet use (UIT, 2020), they are therefore are receptive to interventions that are delivered via technology devices (Brinkel et al., 2014).

Systemic reviews on the effectiveness and feasibility of mHealth-based programs for the prevention and treatment of alcohol and substance abuse have shown positive reports (Hutton et al., 2020; Kazemi et al., 2017). The use of mHealth-based programs for screening, support and treatment of alcohol and substance abuse among university students is more relevant now in the advent of the Covid-19 pandemic when face to face interactions have become more discouraged. Most university programs are now conducted through distance learning and virtual media, including teaching and learning (De Giusti, 2020).

At the same time, students are currently more prone to alcohol and substance use behaviour due to the disruption of their routine and the stress and anxiety emanating from the ongoing Covid-19 pandemic.

This study used the Open Data Kit (ODK) technology to design a mHealth-based peer mentoring prototype and evaluated its usage among students in a university setting. The technology acceptance model theory (D. Davis, 1989; Durodolu, 2016) was used to evaluate the peer mentors' perceived usefulness, resources to use and perceived ease of use of the mHealth-based intervention. Behavioural intention to use and the actual user behaviour of the mHealth-based intervention were assessed. Implementation research theory was used to evaluate the acceptability, feasibility, fidelity to the implementation of the mHealth-based intervention as well as the appropriateness of the intervention (Wozniak et al., 2012).

It was the aim of this study also to determine whether the use of the mHealth-based peer mentoring model led to an increase in the number of students reached by peer mentors and whether it also increased the number of awareness and information provision sessions, screening, brief intervention and referral of students who engaged in the consumption of alcohol and substance use at the University of Nairobi.

1.1 Description of the standard peer mentoring intervention as practised at the University of Nairobi

The recruitment and training of student peer mentors is done by the Alcohol and Drug Abuse Prevention Unit and the Dean of Students' departments of the University of Nairobi. Once every year, the University of Nairobi students are asked to express interest to be trained as peer mentors. This call is made through student organizations, on notice boards in all the university public places and the University of Nairobi students' internet portal. Interested students send their applications through their colleges' deans of students' offices.

The Assistant Dean of Students (ADOS) or the university employed students' counsellors then select up to fifty students per campus to be and trained as peer mentors. The applications are based on a set criterion. Applicants should have no disciplinary cases at the college, they should have at least a B-grade in academics and they should show evidence of possessing good leadership skills. These requirements are set so that the selected students are good role models for positive behaviour on campus who show leadership skills and at the same time they are not struggling with their academic performance.

Once selected, the students undergo training as peer mentors using an existing peer mentor curriculum, this curriculum runs for a period of one hundred and twenty hours with sessions scheduled to run over the weekends and off class hours.

The curriculum teaches the peer mentors the importance of good character, healthy lifestyles, communication skills and how to create fulfilling social relationships. The lessons cover the prevention of alcohol and substance abuse, sexually transmitted disease and HIV/AIDS as well as emotional and mental wellbeing.

The curriculum also teaches life skills to enable students to resist negative peer pressure, be assertive and develop practical skills to enable them successfully navigate life on campus.

At the end of the course, the trainee peer mentors are required to show aptitude in the following areas: -

- i. Demonstrate the appropriate techniques and skills in actual one-on-one counselling.
- ii. Demonstrate appropriate skills for effective interpersonal communication.
- iii. Demonstrate appropriate self-awareness in their personal lives and practice of counselling.
- iv. Demonstrate knowledge of counselling in selected psychological issues.
- v. Demonstrate the ability to communicate behaviour change strategies to students to cope with the demands of campus life.

The graduating student peer-mentors are given resource information, education and communication materials for reference and guidance during their peer mentoring interactions with their fellow students. They are required to disseminate this information to their peers as they also reach out to those who use drugs, have psychological and personal problems and intervene appropriately. The student mentors are instructed to keep a book record of their activities and to make monthly progress reports to the dean's office and the university counselling departments. They are also instructed to refer any difficult cases for further support at the university counselling department. All interactions between the peer mentors and the counselling offices are initiated by the peer mentors as the need arises.

1.2 Problem Statement

The prevalence of the consumption of alcohol and psychoactive substances among students at the University of Nairobi was reported at 63.2% in 2013 (Hassan, 2013).

The university has put in place prevention programs to address the problem of alcohol and substance use among students. However, the uptake of counselling services in universities in Kenya is low (Ngure et al., 2019) and research has shown that university students prefer to consult with their peers instead of using the counselling programs run by their universities (Gajecki et al., 2017). As a result of this challenge, the university embarked on the training of students as peer mentors some years ago now. These student peer mentors are now routinely used as agents of change who interact and guide their fellow students on diverse social issues including substance use avoidance. This program has however reported communication breakdown as it depends on direct and vertical contact between the university counsellors and the peer mentors and the students they are in charge of.

This challenge has been observed to slow down overall program implementation. Moreover, the number of counsellors employed by the university is inadequate to cover the existing needs which further compounds the challenges faced in implementing the program. Lastly, the feedback from student peer mentors is slow and unstructured making it difficult for the program managers to routinely monitor and evaluate the program. This, therefore, called for an innovative intervention to address these challenges, as well as to provide evidence as to the acceptability of peer mentoring practice among university students. This study sought to address these identified gaps in the peer mentoring program among university students.

1.3 Rationale / Justification of the Study

The use of mobile phones was estimated in the year 2015, to have reached over 1.9 billion people worldwide (Brinkel et al., 2014). E-Marketer, an online resource estimated that by 2016, 4.30 billion people worldwide, will be mobile phone users, this is 58.7% of the global population today (www.emarketer.com).

In a recent review, e-marketer notes that an estimated 3.23 billion people, or 80.7% of internet users worldwide, used a social network at least once per month in 2020, these findings have been confirmed by the ‘International Telecommunication Union’ who report that 4 out of 5 people worldwide own a mobile phone device (UIT, 2020). In 2021, that number is estimated to reach 3.35 billion (Global Social Network Users 2020). These social media platforms include Twitter, Snap chart, TikTok, Facebook and WhatsApp, this increased usage has been occasioned by the current Corona virus pandemic as people are restricted to meeting in person and most interactions have now gone digital (Global Social Network Users 2020).

Most university students today use a mobile phone for communication, education, and entertainment. This makes it a powerful tool to use to access students, educate them on social issues like substance use prevention and positively influence their behaviour. The use of mobile phone technology to facilitate intervention programs among young people is likely to create more program impact than traditional communication methods (Choo & Burton, 2018).

The use of mHealth in intervention for mental health programs has been proven to be effective in the delivery of mental health services to wider populations (Harrison et al., 2011, Brinkel et al., 2014, Aranda-Jan et al., 2014). A systemic review of studies on mHealth in Africa concluded that innovative approaches in the delivery of health services would cut the costs of service delivery, thus encouraging a larger reach of health services (Aranda-Jan et al., 2014). This has a positive impact on the overall healthcare system as envisaged in the Sustainable Development Goals (SDGs), particularly goal number 3: “Good Health and Well-being.” (Hambrey, 2017; Organisation for Economic Co-operation and Development, 2017). A study on alcohol-related risk reduction conducted online was found to be effective for community college campuses, this was attributed to increased accessibility to the students, reduced cost

and labour effort of intervention for alcohol use prevention (Donovan et al., 2015). Students also value their privacy thus they prefer convenient and anonymous interventions for their sensitive personal issues (Garnett et al.,2016).

The use of mHealth-based intervention strategies has the potential to enhance impactful interaction between students' peer mentors and their mentees. mHealth-based peer mentoring will improve the implementation, reporting, supervision and follow up of mentoring activities on campus, the implementation data were transferred in real-time to a central repository that was accessible to the psychological counsellors. The use of a mHealth-delivered peer mentoring intervention negated the need for constant direct contact between the university counsellors, peer mentors and students and therefore accelerated intervention implementation, monitoring and evaluation impacting positively on the overall program.

1.4 Research Question

Does the use of mHealth-based decision support tool for peer mentoring improve reach, information provision and treatment referral of students with alcohol and substance use problems at the University of Nairobi?

1.5 Broad Objective

To design and implement a mHealth-based decision support tool for peer mentors in the prevention of alcohol and substance abuse among students of the University of Nairobi.

1.5.1 Specific Objectives

1. To design and create a mHealth-based decision support tool for substance use screening, brief intervention and referral
2. To describe the social demographic characteristics of the first-year students

3. To determine first-year students' attitude towards and prevalence of alcohol and drug use at admission to the university.
4. To apply the mHealth-based tool in peer-mentoring and determine its acceptability among peer mentors.
5. To determine the reach of the mHealth-based decision support tool among the students.
6. To determine the patterns of alcohol and substance use among the students as identified by the peer mentors.
7. To determine the intervention/referral options taken by the peer mentors.
8. To qualitatively evaluate, the experiences of the peer mentors.

CHAPTER TWO

2.0 Literature Review

2.1 Introduction

This section critically discussed studies on substance use among young adults, the use of mHealth interventions (a sub-segment of electronic health (eHealth)) in behaviour modifications strategies and the management of mental health conditions including alcohol and substance use, as well as studies on peer mentoring programs and their effectiveness. These studies used interventions that were delivered via either face-to-face, computer-delivered or a combination of both and they had documented the implementation process, the challenges and effectiveness of the programs. The findings of this review denoted a paucity of evidence-based interventions that focussed on the prevention and management of alcohol and substance use in Kenya, and indeed in the African continent. Most of the available research data highlighted the extent of the problem of alcohol and substance use within the community but there was minimal research done on how this problem was mitigated and addressed in the Kenyan context.

Various studies on the use of interventions that were based on technology for alcohol and substance use prevention and management were reviewed and critically analysed to generate a broad understanding of what evidence was available in the area mHealth and mentorship programs. These study reviews identified gaps in the knowledge and utility of opportunities for improved delivery of intervention strategies for alcohol and substance use prevention and management among young adults backed by research evidence. The use of technology in the management of any disorders was recorded mainly in interventions for TB, HIV and PMTCT programs (Chib et al., 2015; Jennings et al., 2013).

This, therefore, placed a research challenge and a need for more rigorous research on mHealth-based interventions focussed on the African continent.

Peer mentoring as a concept of intervention for substance use prevention was reviewed. There were gaps identified in the area of interventions geared towards alcohol and substance use screening, prevention and management among university students. Most of the available data were for the much younger age group of 10 years to 17 years, this left out the cohort of 18 years to 25 years yet they are more vulnerable to alcohol and substance use and its related negative consequences (White & Hingson, 2013). This, therefore, presented an opportunity for researchers to fill this important gap in knowledge by providing the much-needed evidence of acceptability among university students of the practice of peer mentoring interventions delivered via mHealth.

2.2 Research Gap

2.2.1 The Burden of Substance Use

Alcohol and substance use among young adults is a global phenomenon of public health concern (World Drug Report, 2020; Yi et al., 2017). From medieval times the world over, there is documented use of alcohol and psychoactive substances for diverse reasons. These reasons included religious rituals, during social gatherings, for pleasure and to alleviate discomfort (Jagero & Mbulwa, 2012). Over time, however, there has been more research done on the effects of alcohol and substance use which has highlighted the undesired effects of alcohol and substance consumption, many societies have made laws that deter the use of certain substances (Ngesu et al., 2008, Jagero & Mbulwa, 2012).

The magnitude of the consumption of alcohol and substance use in African countries is high.

In Nigeria, the lifetime prevalence of the consumption of alcohol and psychoactive substances among students at schools in urban settings was 87.3%, while the current use was 69.2% (Oshodi et al., 2010). Similarly, among students in Kenyan universities, up to 69.8% of the students reported that they had engaged in alcohol and substance use in their lifetime (Atwoli et al., 2011). The commonest substances used in Nigeria was caffeine (kola nut and coffee) and mild analgesics (paracetamol and aspirin) (Oshodi et al., 2010), while in the Kenyan study, alcohol, cigarettes and Cannabis sativa were more commonly used. These patterns of consumption of drugs are similar across many countries in the African region. This may be explained by the rapid breakdown of indigenous African societal values coupled with strong foreign influences, resulting in the easy availability, accessibility and consumption of alcohol and substances of abuse mostly by young adults (Nacada, 2012).

Epidemiological studies show that the majority use of alcohol and other substances begins at the college level (Cagande et al., 2014) but little data exists on what programs are being used to prevent and manage alcohol and substance use within the university setting (Ngesu et al., 2008). There are more research interests on the prevalence of and the programs used for alcohol and substance use prevention on the secondary school age group of 10-17-year-olds (Ngesu et al., 2008), while students who are in college-aged 18-25 years have been not been adequately researched yet abuse of alcohol and substances is highest among this cohort (Thomas et al., 2011). The prevalence studies data on alcohol and substance use among 18-25-year-olds has revealed the high levels of the consumption of alcohol and substance use. There is a need therefore to institute appropriate interventions to reverse this trend and to curb the adverse effects of alcohol and substance use among these young people (Atwoli et al., 2011; Tumuti et al., 2014).

Research gaps have been identified in interventions that focus on the prevention and management of consumption of alcohol and psychoactive substances that specifically target university students.

This research focused on mHealth-based peer mentoring program for screening for alcohol and substance use, brief intervention and referral among 18-25 years' students in a university setting.

2.2.2 mHealth Interventions for Substance Use prevention and management

Mobile phone-based health (mHealth) has shown great promise to deliver public health interventions, especially in settings that have limited resources because it has low cost and it is extensive in its reach. Some studies provide evidence that shows that there were benefits from interventions that were implemented through mHealth among breastfeeding mothers and in patients who suffered chronic illnesses (Aranda-Jan et al., 2014; Krishnan & Cravero, 2017). However, there was a lack of rigorous evaluations of the implementation of mHealth interventions among students who are vulnerable to alcohol and substance use (Krishnan & Cravero, 2017). The use of mobile phones for health interventions among students presents opportunities to reach them in their comfort zones, as well as to provide them with privacy and a sense of anonymity (Berman et al., 2015).

Research on the use of technology-based treatments and the use of telephones to deliver health interventions has highlighted the need for evidence-based research on the feasibility and effectiveness of smartphone technology targeted at the prevention and management of alcohol and substance consumption and behavioural modification strategies (Buhi et al., 2012; Luxton et al., 2011). The development of mHealth-based models and identification of behavioural modification treatment modalities and interventions for alcohol and substance use prevention

and management could not have come at a better time (Jennifer C. Elliotta, Kate B. Careya, 2009; Kirk et al., 2013).

There exist gaps in baseline data on the use of mHealth-based programs that focus on reducing the induction into the consumption of alcohol and substances. These data are crucial for designing evidence-based management practices for those who are already consuming and thus there is a need to draw a roadmap to the future of mHealth practice especially in resource-poor countries (AM Dhanookdhary et al., 2010). Furthermore, mHealth-based interventions used for screening and brief interventions have the potential to improve early diagnosis and care provision for alcohol and substance use interventions (HealthIT.gov, 2018; Kazemi et al., 2017).

2.2.3 Peer Mentoring for Substance use prevention

The decision on whether or not young adults will initiate alcohol and substance use is influenced by their peers (Chesang, 2013; Oliha, 2014; Reid, A. E., Carey, K. B., Merrill, J. E., & Carey, 2015). Peers also influence to a great extent the decisions they take as young adults on whether or not they continue the consumption of drugs as well as the type of alcohol and substances they choose to use (Reid et al., 2015). Young adults have a great need for a sense of belonging and they don't like to be different from their peers. Moreover, the consumption of alcohol and substances is more often than not a group activity and especially with groups of friends (Andrews et al., 2002).

The use of Peers to mentor each other and to influence behaviour geared towards the prevention of alcohol and substance use is an effective strategy by research data from the developed countries (Andrews & Clark, 2011; Reid et al., 2015; Sánchez et al., 2017).

Peer mentoring used as an intervention for adolescents who were heavy cannabis users showed a reduction in the levels of cannabis consumption over the six months follow up period (Mason et al., 2017). A peer mentoring program named ‘Mentoring Alcohol Problems’ (MAP), for individuals with disorders related to the use of alcohol conducted in a community setting, showed a marked reduction in alcohol use among the study participants (Tracy et al., 2012). Moreover, some participants remained abstinent from alcohol consumption following the 6 months intervention (Tracy et al., 2012). These studies provide evidence that the practice of peer mentoring to prevent the consumption of alcohol and substances can be used as a core intervention to build life skills that promote healthy and adaptive behaviours for students while in the university (Macarthur et al., 2016; Ngesu et al., 2008).

Studies have shown that friendships and relationships formed among peers last a long time, as peers form a rapport with each other, they also develop a mutual understanding which is essential as they relate in peer mentoring interactions (Sánchez et al., 2017). In their relationships, the peers get a sense of comradeship and can create a shared sense of safety as they mutually support each other in a safe environment (Sánchez et al., 2017). Peers use the natural inclination of information sharing and shared interests to form a strong influence on each other. A systematic review on what factors work to make peer mentoring successful recommended that mentoring interventions should not be for the short-term, mentoring programs should be structured and should last more than twelve months (Thomas et al., 2011). Despite these findings from the developed countries, there is limited evidence from Low and Middle-Income Countries (LMIC) like Kenya on the use of peer-mentoring for alcohol and substance use interventions (Adepoju et al., 2017).

There exists a need therefore to conduct more investigation in this area to explore the nature of mentor-mentee relationships, the acceptability of peer mentorship among university students and to document what factors make a mentoring relationship effective. Another important variable for exploration is the characteristics of effective mentors as well as the attributes of young adults which make them receptive to mentoring (Dunn et al., 2012). This was a study of the provider acceptability of a mHealth-based peer mentoring program for alcohol and substance use prevention in a university setting.

The findings of this study are useful to provide evidence for the feasibility and acceptability of the implementation of mHealth-based peer mentoring in a university setting.

2.3 Definition of Key Concepts

2.3.1 Introduction

The main concepts discussed here include substance use/abuse, mHealth practice, peer-mentoring, knowledge, prevention, and computer-delivered interventions, Decision Support System (DSS) and Open Data Kit (ODK). This study investigated the use of mHealth as a decision support tool for student peer mentors among students at a public university.

2.3.2 Substance use/abuse

Substance use refers to the consumption of alcohol and psychoactive drugs like cigarettes, illegal drugs, prescription drugs, inhalants and solvents (World Drug Report, 2016). These psychoactive drugs affect the functioning of the central nervous system, hence the thoughts, feelings, and behaviour of a person (Rehm et al., 2013). Substance use puts the user at risk of experiencing both psychological and physical negative consequences (Yi et al., 2017).

Substance Abuse refers to the wrong use or using more than the norm of a substance, it is also the use of a substance different from the way it is generally intended, this can be for medical or social intentions. Substance abuse is also the use of any illegal substance or the use of alcohol by those who are underage. It is also defined as the continued consumption of a psychoactive substance even though it is causing negative consequences in one's life (Ali et al., 2006).

Young adults between the ages of 15 and 25 years have reportedly had increased consumption of substances of abuse mostly because alcohol and psychoactive substances are increasingly more available globally (Haddad et al., 2010; Woo et al., 2015). There are potentially harmful consequences associated with alcohol and substance use by this age group. The short term consequences include diminished motivation for academic pursuits, not attending lectures which lead to low academic achievement. There could be injuries as a result of physical hazards, while in the long term these young adults get engaged in criminality, they experience troubles in their social relationships and they are prone to sexual assault and irresponsible sexual behaviour leading to unplanned pregnancies and sexually transmitted infections (Bonomo et al., 2001; White & Hingson, 2013). Other negative outcomes of alcohol and substance use include; addiction (Zufferey et al., 2007), lapses of memory, decline in cognitive abilities, behavioural problems and death (Pascarella et al., 2007). Furthermore, the younger people begin to consume alcohol and substances of abuse, the higher their chances of suffering negative consequences later in life (Yi et al., 2017).

2.3.3 Mobile Health (mHealth) Interventions

The use of mobile phones for the support of healthcare (mHealth) practices is one of the branches of electronic health (eHealth) (Aranda-Jan et al., 2014).

Health and behaviour modification practices are currently being delivered via electronic devices, such as mobile phones, smartphones, patient monitoring devices, Personal Digital Assistants (PDAs) and laptop computers (Brinkel et al., 2014; Weaver et al., 2014). Current trends show that the use of mHealth for healthcare delivery and health research is of public health benefit (Choo & Burton, 2018) this technology uses interactive voice interface, text messaging and videos to deliver health interventions (Buhi et al., 2012; Luxton et al., 2011).

mHealth technology has made a tremendous revolution to the accessibility of public health services, collection of research data and encouragement of healthy behaviour choices (Boyer et al., 2010). There is growing research evidence supporting the effectiveness of mHealth in alcohol and substance use management (DeMartini et al., 2015; Luxton et al., 2011; Stead et al., 2013; Weaver et al., 2013).

2.3.4 Mentoring in intervention for substance use

The description of mentoring has taken different angles as defined by many different authors, it is not surprising that different terminologies are used interchangeably in an attempt to describe mentorship and the associated activities, some of these terminologies include learning, educating, tutoring and guiding (D'Abate et al, 2003). Mentoring as a behaviour change strategy has been used for many years (Topping, 2005). Peer learning has been defined as the process of gaining skills and knowledge from a person who has been matched to another of whom they share similar characteristics, these maybe in terms of age or academic status (Topping, 2005). Initially, the practice of mentoring was viewed as one involving two people one usually older and the other a younger who met one on one, and formed a mentoring relationship that lasted a long time.

The mentor was seen as moulding the mentee's life, in the diverse areas of personal development, academic and in their professional development (Andrews & Clark, 2011).

The definition of mentoring has also been proposed as the practice of a senior more knowledgeable person extending support to a younger less knowledgeable protégé, in their personal or professional lives (J. Andrews & Clark, 2011; Steward I Donaldson, Ellen A Ensher, 2000). It is, however, proposed by current research findings on peer-mentoring that people of the same age can mentor each other and that mentoring has nothing to do with seniority (Owen et al., 2018; Sánchez et al., 2017). In the digital technology era, mHealth mentoring still retains the same traditional characteristics of mentoring but a communication interface has been added.

2.3.5 Computer-delivered interventions for alcohol and substance use

A Computer-delivered intervention (CDI) is defined as strategies delivered by electronic text messages, interactive voice interfaces or electronic mails (Berman et al., 2015). They are used in public health research and other clinical programs. To find effective strategies for the prevention of the consumption of alcohol and substances among students on university campuses, CDI has been designed (DeMartini et al., 2015). Their advantages include the fact that they can be used at the convenience of the user thus having the potential for the extensive reach of the population. Also, they are less costly, they are easily accessible and readily available (Jennifer et al., 2009, Carey et al., 2013).

Various researchers adduce evidence to the potential for public health benefits, and the success of using CDI to effectively deliver psychological support in marijuana and smoking cessation programs as compared to traditional face to face methods (Brendryen & Kraft, 2008; Lee et al., 2010; Leeman et al., 2015).

2.3.6 Knowledge

Knowledge is defined as the general conscious awareness of the thinking strategies used during instruction (Zohar, 2012).

Knowledge is also cognitive contact with reality acquired by experience or education (Zagzebski, 2017). When introducing an innovation, people must be made aware of the existence of the innovation, which in this case is the mHealth practice. The how-to knowledge is what helps the peer mentors to learn how to use the innovative intervention. Then there is the practice- knowledge which is the functioning principles that describe how and why an innovation works (Glanz et al., 2008).

2.3.7 Prevention

Prevention in public health has been defined as any activity that plans for and any measures taken (at least partially) aimed at averting, delaying or reducing the onset of an outcome before it occurs in the general population or subpopulations (Mobilisation, 2011). In this study, prevention is the use of mHealth-based peer mentoring strategies aimed at delaying or reducing drug use, and/or its negative consequences among students at the University of Nairobi.

2.3.8 Decisional Support System

A Decision Support System (DSS) is a technology-based application that accepts inputs that are then analysed to inform a healthcare provider's decision (HealthIT.gov, 2018). The DSS receives a piece of person-specific information, which is then checked against a pre-programmed algorithm to inform the diagnostic support, suggest next steps of treatment and provide alerts to the provider (Berner & La Lande, 2007). The concept of a Decision Support System (DSS) has been used to effectively manage chronic diseases and guide the allocation and mobilization of medical resources (Sebaa et al., 2017; Woo et al., 2014).

This technology was used in this study to design a mobile app prototype that was used by student peer mentors to provide screening, brief intervention and referral to care for students who engaged in alcohol and substance use.

2.3.9 Open Data Kit (ODK)

Open Data Kit is an extensible, open-source suite of tools designed to build information services, ‘Collect’ is the android platform that gives application logic and supports the manipulation of data (Hartung et al., 2010). To address the problem of the current paper-based processes that are inefficient, the ODK application has been used for electronic data collection in public health, food security and emergency relief activities (Maduka et al., 2017; Sayinzoga & McCann, 2017). One ability of the ODK Collect is that it transforms inserted algorithms into prompts supporting logics, input constraints, multiple select questions, and image views. These features make ODK a very favourable application to build a DSS.

This study used ‘build ODK’ technology to design a mHealth-based decision support tool for alcohol and substance use screening, brief intervention and referral using the Alcohol Use Disorder Identification Test (AUDIT) and Assessment of Smoking and Substance Involvement Screening Test (ASSIST) which are World Health Organization (WHO) approved alcohol and substance abuse screening tools. This prototype was introduced to the student peer mentors at the University of Nairobi. The student peer mentors were then trained to use this tool which was installed in their android phones for their peer mentoring activities with student mentees while on campus.

2.4 The mHealth-based peer mentoring intervention

Part I: mHealth-based decision support intervention implementation process

The research intervention was mHealth-based decision support peer mentoring too for screening, brief intervention and referral of students who engaged in alcohol and substance use within the university campus. University students were identified and recruited as peer mentors following the set University of Nairobi standard practice, while they were in their first year in college; they were then trained using the available peer mentors' curriculum.

All the recruited peer mentors were introduced to the study by the principal investigator (PI) and were requested to participate. They were informed about their right to voluntary participation. There were no consequences to anyone who chose not to take part in the study, also they were not denied any services offered to students at the university. The students were requested to express their willingness to take part in the study by signing a consent form. Those who gave written consent had their mobile phones installed with the 'mHealth Peer Mentoring prototype' app which was based on the Open Data Kit technology. They were then trained on how to use the prototype for their peer mentoring activities on their campus.

The mHealth-based application guided the student peer mentors in a step by step decision making as they helped their fellow students who presented with psychological challenges. Most of the presented problems were related to alcohol and substance use.

The peer-mentoring intervention process

A student peer mentor would make contact with the student mentee they have identified, they then did a screening and assessed the severity of the presenting issue. This assessment was based on screen-by-screen questions based on AUDIT and ASSIST that was programed in the mHealth-based peer mentoring prototype.

The process of responding to these questions was either administered by the mentors or each mentee could self-administer the questions and then choose a suggested option of appropriate intervention. The mHealth-based peer mentoring app had inbuilt algorithms that were programmed to calculate the student's specific alcohol and substance use scores, these scores then determined the pathway for care. Possible programmed intervention options included information dissemination, basic brief therapeutic intervention, referral and linkage to care and support as well as follow-up sessions.

Referrals were made to the Youth Centre in Kenyatta National Hospital (KNH), the University Health Services clinics, and the Student Counselling Department.

This information from the peer mentor and mentee interactions was then fed into the Open Data Kit briefcase. The information included, the number of contacts made between the peer mentor and the mentees, the mentee social demographic characteristics, the presenting problems by the mentees, all the assessments scores that were done by the peer mentor, referral of mentees for professional care and the intervention that was given to the mentees. The measurements of interest were, the number of contacts made by the peer mentors, type of problem presented by the mentees, type of action taken by the peer mentor, number of mentees referred by the peer mentors for more professional care, and the prevalence and patterns of substance use as screened by the peer mentor. The peer mentors from the standard practice campus followed a similar process, but instead of using the mHealth-based prototype, they used a paper-based tool to collect similar information. This information was then collected and stored at the dean of students' office for further processing.

Part II: Identifying students who needed peer mentoring help:

To identify students who needed peer mentoring assistance, there were various approaches which were used as follows:

- i. Direct approach: Peer mentors as part of their daily routine approached and made rapport with their fellow students while on campus during their normal daily activities. These interactions happened during class time and around campus in other social forums as well as in the students' halls of residence. They would then make observations that a certain student or students needed assistance with various psychological concerns based on their knowledge and training about the behaviour of and challenges encountered by students while in college. They would then approach the identified student privately and intervene in the situation using the set protocols as guided by the mHealth-based tool that had been installed in their smartphones.
- ii. Friends' approach: A friend of a student who was struggling with psychological issues while on campus would approach a peer mentor and request them to intervene in the case of their student friend who may have had psychological challenges. This was possible because peer mentors held sensitization forums on campus and they were also branded in T-shirts. The peer mentor would then approach the said student and then start the intervention process following the mHealth-based set protocols.
- iii. Self-referral from an affected student: A student would realize on their own that they needed help, based on their current situations and thus approach a peer mentor for guidance in the life problems. The peer mentor would then intervene in this case using the knowledge and guidelines taught to them during the peer mentoring training.
- iv. University staff/ faculty would from time to time refer students they encountered facing difficulties to be attended to and assisted by the trained peer mentors. The peer mentor would then take up the referral and use their skills to help their fellow students as necessary.

Part III: Information dissemination was done in any of the following ways:

Peer mentors:

- i. Interacted with mentees who presented with problems in private sessions: Here a peer mentor and a mentee met and interacted with one on one in a mutually agreed time and a secure environment.
- ii. Used small focused groups for the dissemination of information on pertinent psychological issues facing students while in college. Peer mentors were trained to communicate behaviour modification messages to their fellow students while on campus during social forums.
- iii. Organized big groups for sensitization on topical issues like drug use prevention, sexuality, and other emerging issues that were of interest to student life in college. The peer mentors would mobilize fellow students to attend and participate in organized events on campus, they would then invite experts in various fields to help them pass factual and professional messages during the outreach programs to their fellow students.
- iv. Used social media platforms to pass and disseminate condensed summarized youth-friendly information to their peers. These social media platforms included: WhatsApp, Instagram and Facebook. The peer mentors would also use emails and direct mobile messages to reach their student mentees.

Part IV: Diagnosis was done using World Health Organization (WHO) approved tools

- i. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST), is an internationally standardized screening tool that was designed for use across a range of countries and cultures. It was programed in the mHealth-based tool to screen for the problem or risky use of tobacco, alcohol, cannabis, cocaine, amphetamine-type stimulants, sedatives, hallucinogens, inhalants, opioids, and 'other drugs'.

Data on the ASSIST indicates that it has good concurrent, construct, predictive and discriminative validity.

- ii. The Alcohol Use Disorders Identification Tests (AUDIT), is a simple and effective method of screening for unhealthy alcohol use, defined as risky or hazardous consumption or any alcohol use disorder. The AUDIT can also help identify alcohol dependence and specific consequences of harmful drinking.

It is widely used in a range of health settings, but with suitable instructions, it can be self-administered or used by non-health professionals. This tool was also programmed to assess the patterns of alcohol use among the students.

2.5 Conceptual Framework

2.5.1 Implementation Science theory

The implementation science theory was used to guide this study as it explains the processes of introducing a new intervention and the consideration of people's intention to adopt and actual use of new technology. Thus the conceptual framework was nested on the implementation science model (ISM).

First, we identified the problem which needed to be changed then the implementation process was used to outline the steps that would lead to the desired outcomes (Proctor et al., 2011).

In this study, the identified problem was the low impact and inadequate feedback on the current/standard peer mentoring program for the prevention of alcohol and substance use among students at the University of Nairobi. Designing a mHealth-based decision support tool, then training peer mentors on its use and implementation of the mHealth-based peer mentoring program would bring the desired change.

The goal of this intervention was that the peer mentors would learn the novel mHealth-based peer mentoring practice, that they would perceive it as useful and feasible and thus accept to use it for peer mentoring interventions. The anticipated outcome was that as peer mentors adopted the mHealth-based practice, they would deliver a uniform peer-mentoring intervention to a large number of fellow students. The desired impact was to have a university-wide uniformly implemented peer mentoring intervention that was accepted by the mentors and the students.

These would, in the long run, lead to increased literacy on the negative effects of alcohol and substance abuse and thus reduced substance use by university students.

Implementation strategies that determined the outcome of this study included: the student peer mentors who used the mHealth-based tool for intervention and decision making support, they were the stakeholders who facilitated the intervention delivery, the current peer mentoring program, as well as training of student peer mentors in mHealth based intervention.

Implementation outcomes were indicators of the success of this peer mentoring intervention. This study focussed on the proximal indicators and intermediate outcomes in treatment effectiveness these included, acceptability, appropriateness, feasibility and fidelity (Proctor et al., 2011). The study assumed that student peer mentors would perceive the intervention as useful, appropriate and feasible, and thus acceptable for their use.

This conceptual framework is outlined in diagram 1 below

Diagram 1: Conceptual Framework

The Conceptual Framework is based on the implementation of science theory

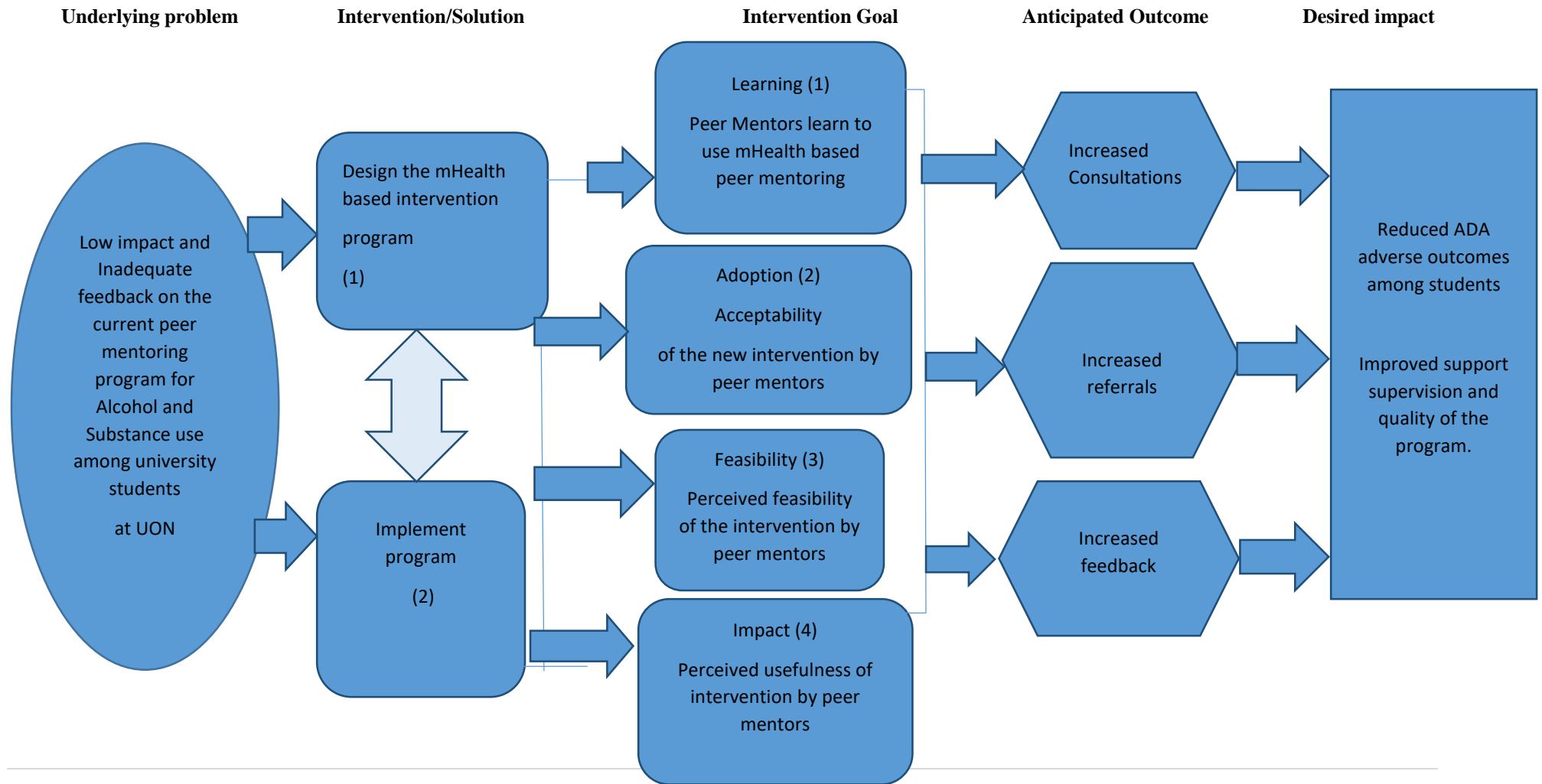
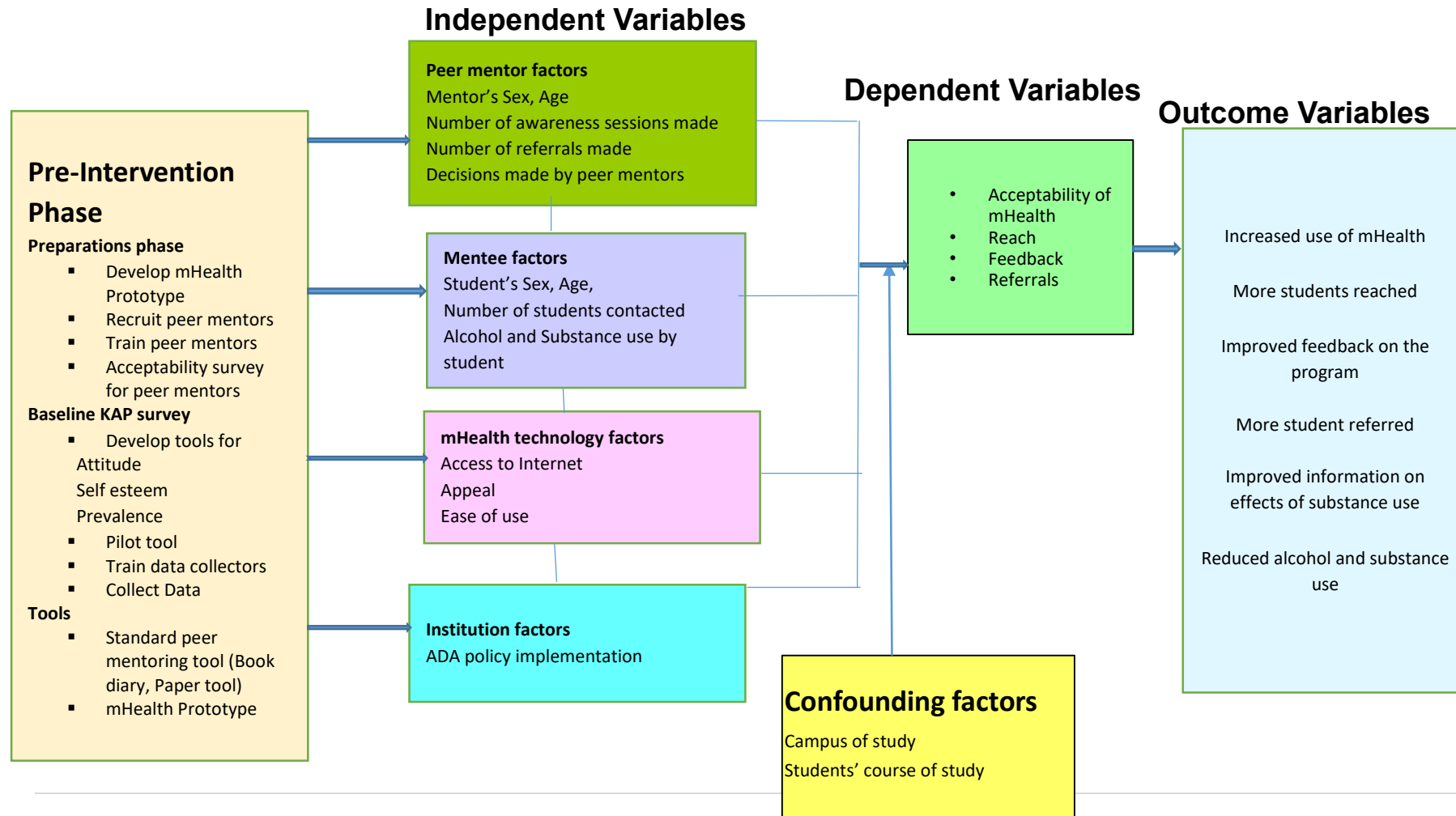


Diagram 2: The Study Variables

This diagram outlines the relationship of the various study tasks and variables



2.5 Literature on study methodology

Most studies on the use of mHealth in public health interventions used randomized control trials, descriptive, observational, qualitative and quantitative designs (Kypri et al., 2015; Luxton et al., 2011; Zhang & Creswell, 2013). Differences were noted in the parameters of mobile phone apps examined, the moderating variables and the follow-up durations (Woo et al., 2014, Berman et al., 2015). Also, the sampling frames were diverse, in some studies, respondents were college going students, in a single university (Martens et al., 2013), while others got their samples from multiple university campuses (Berman et al., 2015).

The sampling procedures used included, random sampling, convenient and purposive sampling (Xue & Lu, 2016; Yi et al., 2017). These differences made these study findings not generalizable. Most of the studies used quantitative designs, while qualitative study methodology was rarely applied in the studies, and this may have left out a pool of rich depth of research findings, there was the need for focused group discussions and key informant interviews. The use of mixed methodology would have yielded more in-depth findings. Besides, all the studies reviewed were carried out in Europe and America, it was necessary to replicate them in Africa to document the peculiar African cultural characteristics that may affect specific interventions.

2.5.1 Choice of study method

This research applied mixed methodology procedures; the qualitative data enriched the data collected quantitatively by giving an in-depth understanding of the perceptions of peer mentors towards mentoring and filling up existing gaps in the program. This improved the quality of the data and yielded more representative results, thus increasing the fidelity of the intervention effectiveness and thus the results presented.

The findings of this study provide a baseline for evidence for the use of mHealth-based interventions for screening, brief intervention and referral of alcohol and substance use among university students in the Kenyan and African context.

2.6 Conclusion

It was evident that the use of mHealth-based interventions for screening, brief intervention and referral of students who engage in alcohol and substance use held great promise for better program implementation (DeMartini et al., 2015). mHealth-based interventions for college students were documented to have advantages over face to face interventions as they did not require training of counsellors, scheduling of interview times and the students could use them at their own time (Walters & Neighbors, 2011). Electronically delivered interventions, like mHealth, had the advantage of overcoming the often many difficulties and barriers of interacting with the youth and thus reach them through their most comfortable medium of technology (Buhi et al., 2012; Mays et al., 2010). Thus, embracing the new era of young adults who are technologically savvy, e-mentoring technology was used to reach the target group using the smartphone and social networks including Facebook, WhatsApp, Twitter and Instagram (Donker et al., 2013). This study promises a local breakthrough for the screening, early identification and intervention of alcohol and substance use among university students.

CHAPTER THREE

3.0 Methods and Materials

3.1 Study Design

This was a comparative, mixed-methods quasi-experimental study. It compared two groups of peer mentors, one group, used the standard practice (as is current practice) while another group, used a mHealth-based decision-support tool designed for this study. The standard practice group of peer mentors were trained to use paper-based tools for peer mentoring. They were requested to identify students on campus who needed mentorship and intervened according to set procedures. They were instructed to document their activities in a book diary as was the usual practice. They were trained to refer any students with serious psychological or alcohol and substance use problems to university student counsellors for care. On the other hand, while the mHealth-based cohort of peer mentors received the same instructions, instead of using paper-based assessment tools, used an intervention tool programmed on a mHealth-based application. They were equally required to identify and intervene with their peers who had psychological problems, especially alcohol and substance use. They were as well instructed to refer difficult cases to university student counsellors.

3.2 Study Area

The study was conducted at the University of Nairobi which is the oldest university in Kenya, having been founded in 1956 as the Royal Technical College. In 1970, the University College Nairobi transformed into the first national university in Kenya and was renamed the University of Nairobi. It is currently the largest University in Kenya with a population of about 61,000 students, at both graduate and postgraduate levels.

These students were publicly sponsored (module I) as well as privately sponsored (module II). They resided both in university halls of residence and outside the university premises. The majority of the students were non-residents due to module II programs and less availability of students' accommodation at the university campuses. The university has several colleges located at its 8 different campuses (www.uonbi.ac.ke). The College of Biological and Physical Sciences at the Chiromo Campus was purposively selected to host the mHealth-based cohort and the College of Education and External Studies at the Kikuyu Campus hosted the standard practice cohort. These colleges were selected because previous surveys had shown the Chiromo campus and Kikuyu campus to have a high prevalence of substance use among the University of Nairobi students (Hassan, 2013). They are geographically widely separated therefore the possibility of cross-contamination of study subjects was thought to be low, also, they had distinctly differentiated fields of study thus eliminating responder bias.

3.3 Study Population

All the first-year undergraduate students registered for the academic year 2018/19 in Kikuyu and Chiromo campuses constituted the study population. These were undergraduate male and female students aged between 18 years to 25 years. They were transitioning from high school education to college education. Many of these students were living away from their parents and homes for the first time in their lives. They thus experienced a lot of freedom and no close supervision. The economic status of the students was diverse, some of them had and managed large amounts of money. At the same time, others received higher education and loan facilities provided for university students. This led them to be susceptible to influence from peers to indulge in alcohol and substance abuse as well as other adjustment challenges. However, some students came from poor social-economic backgrounds, so they had little money to get by.

The stress of adjusting to college life and the disparities of daily living could easily lead them to experiment with alcohol and substance use as a coping mechanism.

These students were both publicly sponsored and privately-sponsored who either resided in college accommodation or out of campus premises.

The students in the College of Biological and Physical Sciences studied science-based programs including Bachelor of Science in Analytical Chemistry, Bachelor of Science in Astronomy and Astrophysics and Bachelor of Science in Environmental Conservation and Natural Resources Management, among others. The students in the College of Education and External Studies studied education-based courses like Bachelor of Science in Wildlife Management, Bachelor of Education Science and Bachelor of Arts Design among others. These were all 4-year degree programs.

Definition of cases and controls

This study was conducted in three phases. Phase one of the study was to design the mHealth ODK-based tool and conduct the baseline survey of the attitude towards and prevalence of alcohol and substance use among the first-year students. The study sample was 406 first-year students from the Kikuyu campus and Chiromo campus, participants were divided proportionately to the enrollment from each campus.

In phase two of the study, we implemented the mHealth-based peer mentoring prototype. The study participants were 100 peer mentors from both Chiromo and Kikuyu campuses. After recruitment and enrolment, the study was explained to the participants and then they consented to take part in the study. The study participants were first-year students who were willing to undergo the UoN peer mentors training and be role models for positive behaviour in university.

Students from the Chiromo campus were purposively selected as the mHealth-based cohort and they thus received extra training on the use of mHealth-based decision support prototype for peer mentoring.

Students from the Kikuyu campus were assigned as the control group, so they received the usual UoN curriculum peer mentoring training and were trained to use a structured paper-based intervention tool. Also, every two weeks for six months, all the peer mentors in Kikuyu and Chiromo campuses received supervision and support in their peer mentoring activities.

In phase three of the study, randomly selected peer mentors from both groups participated in focused group discussions. They shared their experiences with the use of either a mHealth-based prototype or the standard practice approach for peer mentoring.

3.3.1 Inclusion and Exclusion Criteria

3.3.1.1 Inclusion Criteria

Inclusion Criteria for students

First-year students in the study campuses who were aged 18 to 25 years and gave written consent to participate were included in the baseline survey.

Exclusion criteria for students

Those who were repeating the academic year or those joining campus on transfer from other universities.

Inclusion criteria for peer mentors

First-year students from the experimental and control campuses who expressed interest in the college mentorship program, those who possessed an android based smartphone and those who gave written consent to participate.

3.3.1.2 Exclusion Criteria for peer mentors' selection

Students who were repeating their first year of study or those who had disciplinary cases in college.

3.4 Sample Size Determination

3.4.1 Sample for baseline prevalence survey

The sample size was calculated using Cochran's (Daniel, 1999) formula;

$$n = \frac{Z^2 x P(1 - P)}{d^2}$$

Where,

n = Desired sample size

Z = value from standard normal distribution corresponding to desired confidence level ($Z=1.96$ for 95% CI)

P = expected true proportion (estimated at 50.0)

d = desired precision (0.05)

$$n_0 = \frac{1.96^2 x 0.50(1 - 0.50)}{0.05^2} = 384$$

A sample size of **384** students was required for the study, these students were proportionately drawn from the two campuses based on their students' enrolment.

3.4.2 Sample size determination for peer mentors, phase two of the study

The whole population of 100 student peer mentors who gave consent, were eligible to participate in this study. These were all the peer mentors in their 1st year of study at the Kikuyu and Chiromo campuses of the University of Nairobi.

3.5 Sampling Procedures for Baseline Survey

Sampling probability to population size (PPS) strategy was employed. At the first stage, purposive sampling of the eight campuses of the University of Nairobi selected Kikuyu and Chiromo campuses. This selection was based on the documented high prevalence rates of alcohol and substance abuse among the students of these campuses (Hassan, 2013).

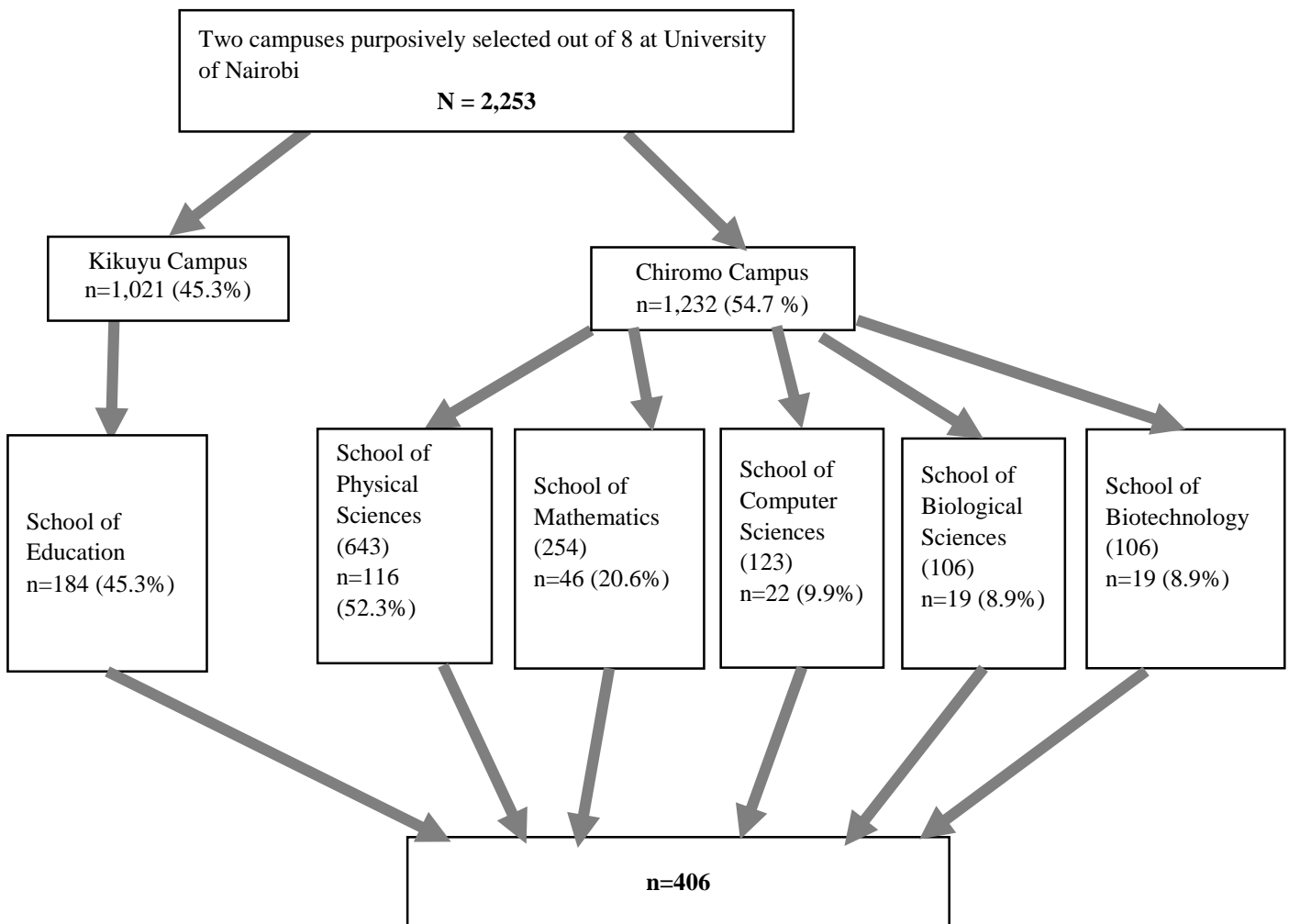
At the second stage, total population sampling was done whereby all the six schools making up the Kikuyu and Chiromo campuses were studied. These schools are Education in Kikuyu, and Physical Sciences, Biological Sciences, Mathematics, Biotechnology and Computing in Chiromo.

At the third stage, the enrolment lists of first-year students in these schools were obtained and used to make the sampling frame for simple random sampling. The frame comprised 1,021 (45.3%) students in Kikuyu and 1,232 (54.7%) students in Chiromo. Kikuyu Campus with its one school retained the size of its frame for its School of Education. In Chiromo Campus the five schools had each allocated a population-proportionate sampling weight (Fig 1). These various sampling frames were used for the third stage of sampling.

Simple random sampling was applied to each of the constructed sampling frames. First, students were assigned a number starting from 1 – 1,021 in Kikuyu Campus and 1 – 1,232 in Chiromo Campus.

Random numbers were generated from the computer software Random.org and used to select study participants from each school. Secondly, the students in each school of Chiromo campus were randomly sampled by application of proportions to the population as summarized in **Fig 1**. A final total of 406 study participants was selected.

FIGURE 1: FLOW CHART OF THE SAMPLING PROCEDURE



3.6 Recruitment procedure

Phase one of the study

Data for the baseline survey were collected in lecture rooms, the principal investigator (PI) approached the lecturers and requested 30 minutes to administer the questionnaires. The PI then went to the classes and requested the students for their time, she addressed the students and explained the nature of the study to them. All the students enrolled in a particular course were assigned a unique student number. These numbers were used to make a class list. A randomization program was used to generate a list of those numbers to be selected.

The students whose numbers were randomly selected were then approached and requested consent to participate in the survey. If the student was not present in class on the data collection day or they declined to participate, the student whose number was next on the class list was approached and requested to participate. The students were requested to complete a WHO standardized questionnaire on their attitude towards and practice of alcohol and substance use. There was no interference from the PI or their research assistants. However, the PI or the research assistant was available for any clarifications. This process was repeated until the required sample size was achieved. Filled questionnaires were collected by the principal investigator or research assistants and checked for completeness. They were then transported and securely stored in a locked drawer and retrieved later for further cleaning and data processing.

Phase two of the study

All first-year students from Kikuyu and Chiromo campuses were informed about the study, they were requested to apply for consideration as peer mentors. Interviews were done using a set criterion, then one hundred peer mentors were selected to participate in the study. Inclusion criteria were the first-year students who expressed interest take part in the peer mentoring program, those who had an android smartphone and those who gave written consent. Students who were repeating the academic year of study, as well as those who had disciplinary cases, were excluded from the study.

Recruitment procedure

Advertisement for recruitment of peer mentors was made through student forums, student internet portals, student leaders, notice boards and distribution of flyers in college. Interested first-year students were requested to apply for training as peer mentors on their campuses.

The criteria for inclusion were: first-year students, had scored a B plus and above at Kenya certificate of secondary examination, those who demonstrated involvement in school clubs, and had leadership skills. One hundred and twenty students responded to the advertisements and sent in their applications. On further vetting, twenty applicants did not meet the threshold and their application was unsuccessful, while one hundred applicants who meet the set criteria were interviewed and recruited for training as peer mentors. The selected students were taken through the consenting process to participate in the study. Students from the College of Biological and Physical Sciences (mHealth-based group) who gave written consent to participate in the study were taken through further training on the use of the Open Data Kit technology-based peer mentoring tool. The program was installed on their android phones and they were trained on how to use it. Peer mentors from the College of Education and External Studies (standard practice group), were trained on the use of a structured paper-based tool for peer mentoring, they also used book diaries to record their activities.

After the initial training of the study, all the peer mentors' complete questionnaires on their acceptability of the process they had been trained to work with. The intervention process lasted 6 months after which, randomly selected peer mentors from both groups participated in a focused group discussion. A total of 4 focussed group discussions were conducted and the peer mentors shared their experiences with the use of either mHealth-based technology or the paper-based approach they had used for peer mentoring.

FIGURE 2: FLOWCHART OF THE RECRUITMENT PROCEDURE

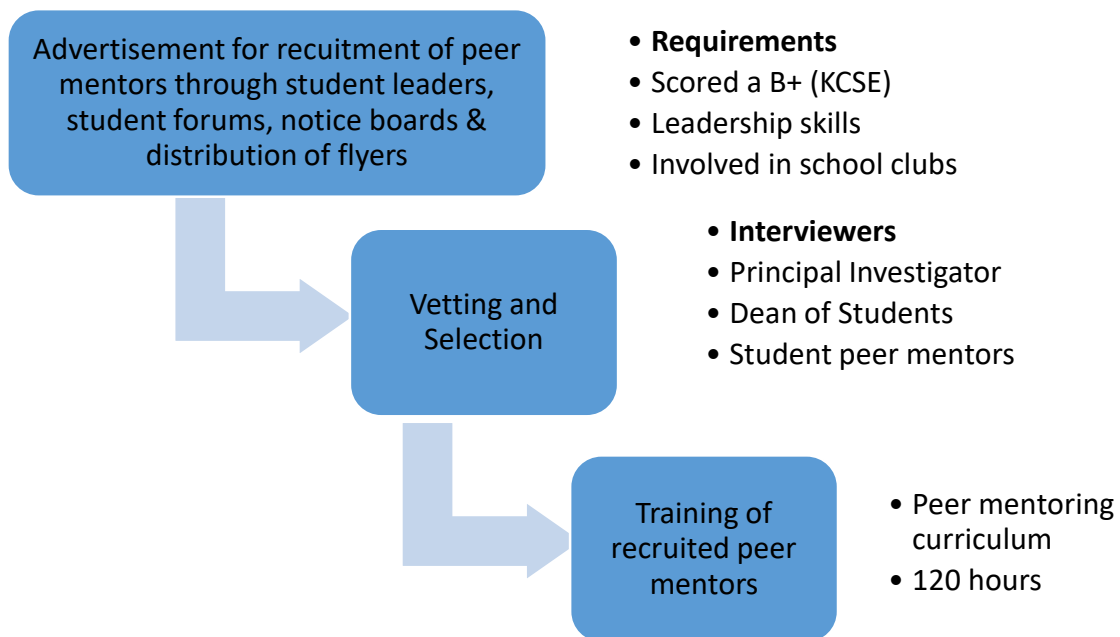
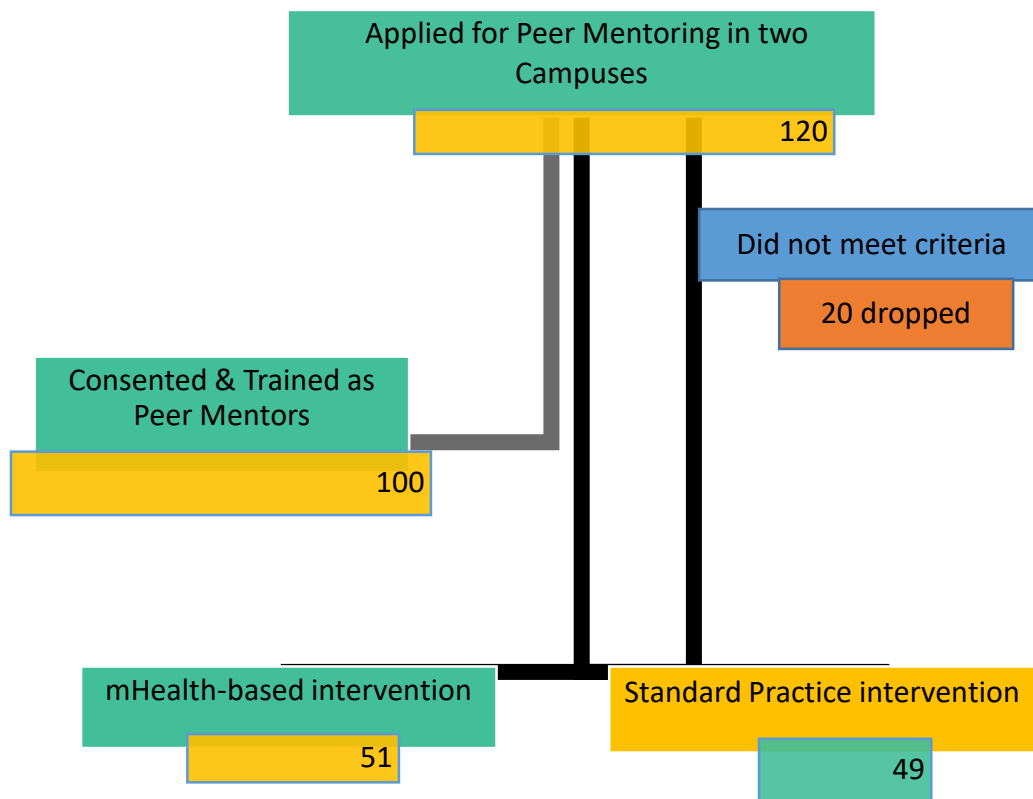


FIGURE 3: FLOWCHART OF INTERVIEW AND CONSENTING PROCESS



3.7 Design and development of mHealth-based decision support prototype for peer mentoring

To build the mHealth-based DSS prototype for alcohol and substance use screening, brief intervention and referral, several activities were undertaken. Two alcohol substance abuse screen tools were used to design the DSS. These tools were the ASSIST a tool developed for the WHO to detect and manage substance use and related problems (*WHO / The ASSIST Project - Alcohol, Smoking and Substance Involvement Screening Test*, 2018) and the AUDIT a 10-item screening tool that assesses alcohol consumption, drinking behaviours, and alcohol-related problems (Babor et al., 2001). The ASSIST and AUDIT tools consist of questions that are scores-based responses on alcohol and substance use, the scores are grouped into low, moderate and high risk. The risk score determined the intervention or treatment needed.

Various ODK system features were used to design and program the mHealth-based DSS for alcohol and substance use screening and referral prototype. XLSForm (<http://xlsform.org>) is a standard form used to create an author extensible Mark-up Language (XML) form in a human-readable format using a spreadsheet application that provides a standard for sharing and collaborating form authoring. XML is a software and hardware-independent tool for storing and transporting data (<https://www.w3schools.com>).

As an open form standard XLSForm allows a programmer to author a form with complex functionality like skip logic in a consistent way on mobile data collection platforms. Several question types including text, integer, multiple-choice questions, date and time and calculation are supported by the XLSForm programming standard. To build an algorithmic decision support system in the alcohol and substance use screen tool for peer mentoring, several XLSForm features were used in the programming.

‘Formulas’, a feature allowing mathematical operators including addition, multiplication, subtraction and division were added in the programmed tool to enhance the functionality and the quality of collected data. ‘Calculate’, an XLSForm feature enabling the programmed tool to perform calculations using responses from the preceding question(s) was implemented to guide the screening algorithms. ‘Constraints’, a feature to improve data quality by specifying limits to an answer input by the application’s user was also incorporated; this validation prevents wrong inputs thus ensuring the algorithm arrives at the correct decision. ‘Relevance’, a feature making it possible to skip subsequent questions based on earlier responses were included in the tool programming.

To ensure that all of the required questions were responded to, ‘Required’, an XLSForm feature was used. This feature ensured that the tools could not move to the next question or be submitted to the server if a required question’s answer was missing. ‘Reference’ data was used in the screening form to improve the algorithm ability; the ‘pre-load feature of the XLSForm programming language was used. This feature made it possible to load pre-existing data to a form based on pre-identified responses or variables and reference it throughout all the responses in the screening tool. The pre-loaded data was also used in multiple select questions as dynamic choice lists. The ‘Cascade’ feature made it possible to cascade responses based on the previous question’s responses making provided answers accurate and logical.

To improve the usability and user experience of the programmed tools, usability testing was done aimed at improving the quality of the mHealth-based prototype. Piloting was done with 5 randomly selected student peer mentors who interacted with the application prototype.

Their feedback and user experience was incorporated into the final design. After the usability testing, the programmed tools were then introduced to the mHealth-based intervention cohort of the study in training sessions. During a peer mentoring interaction between a peer mentor and a mentee, a screen-by-screen prompt of screening questions appeared to the peer mentor, who would then input the mentee's responses on the device. The responses were calculated and aggregated based on a pre-programmed algorithm. The aggregated score then determined what intervention the mentee needed. The intervention would be a brief intervention (counselling) or referral and linkage to care. The ODK systems were customized to have an in-built capacity for real-time transfer of data and interaction between peer mentor and the principal researcher through a real-time transfer of collected data/information and intervention actions to a central server set up specifically for the study.

3.8 Data Collection Procedure

Peer mentoring intervention

At the beginning of the academic year, peer mentors in the first year of study were selected as is the usual practice. An advertisement was made through the student forums, student leaders, notice boards and distribution of flyers in college. Those who met the set criteria were vetted and recruited for training as peer mentors. Students from the Kikuyu and Chiromo campuses were trained together on the process of peer mentoring. The training was conducted based on the current peer mentoring curriculum for both groups. Additionally, students from the Chiromo campus were requested to give written consent for further training on the use of the peer mentoring software based on the ODK platform. The application was then installed on their smartphones and they were trained on its use. They used this platform for their peer mentorship activities.

Both groups were sent out after training to serve their peers as mentors as is usual and requested to report back every two weeks during organised group support supervision sessions with the principal investigator.

The standard group (Kikuyu Campus) got the standard instruction manuals, information, education and communication materials, paper manuals and were asked to keep a journal detailing all their mentoring activities and to call into the students' clinic as usual or to seek a counsellor on duty for support. The data generated by peer mentors, who used the mHealth-based program was directly and securely transferred into a central open data kit server. All the peer mentors were followed up and supported every two weeks. Any program implementation outcome, differences noted were attributed to the type of intervention used.

Intervention procedure

- i. Data were collected from peer mentors documenting all awareness sessions in terms of place, length, topics covered, and attendance numbers.
- ii. All cases (mentees) attended to, point of contact, problem area, and intervention given were recorded.

The implementation process of the experimental method was determined by comparing data from the two groups for significant differences.

Indicators were:

- i. Acceptability of both the mHealth and paper-based peer mentoring intervention program
- ii. Perceived usefulness of the peer mentoring intervention programs used among the peer mentors

- iii. Perceived ease of use of the peer mentoring intervention programs among the peer mentors.
- iv. The number of contacts made by each group of peer mentors.

At the end of the study, the principal investigator qualitatively facilitated focused group discussions to explore the personal experiences of peer mentors within both the peer mentoring programs.

Peer mentors completed a standardized questionnaire on their acceptability, feasibility, perceived usefulness and perceived ease of use of either the mHealth or paper-based peer mentoring intervention.

Data from the control group were collected based on a checklist developed by the principal investigator from the standard practice program to capture their experience with the mentorship program as is currently practised at the University of Nairobi.

Attitude, self-esteem and prevalence survey

The baseline survey was conducted in both the College of Biological and Physical Sciences at the Chiromo Campus and the College of Education and External Studies at the Kikuyu Campus. The study sample was 406 first-year students. Standardized questionnaires were given to the students at the beginning of the study to record their attitude towards and practice of alcohol and substance use among the target groups. The PI explained the study protocol and ethical considerations to the students, those who met the recruitment criteria were requested for written consent to participate. They were recruited and completed self-administered WHO standardized questionnaires to assess their alcohol and substance involvement.

Data Collection Instruments for mHealth based peer mentoring intervention

- i. A researcher-designed Social demographic instrument captured the social-demographic characteristics of the peer mentors. These included the age, sex, marital status and place of residence of the participant.
- ii. A standardized tool adapted from the perceived resources and technology acceptability model (PRATAM) to measure the perceived resources to use, usefulness and perceived ease of use of the mHealth based peer mentoring intervention. The tool was developed to explain why people accept or reject modern technology. The validity and reliability of the have been proven in several studies to be high (Ajzen, 2006, Durodolu, 2016).
- iii. Acceptability, intervention appropriateness and feasibility of the mHealth based peer mentoring intervention standardized tool based on the RE-AIM model (Glasgow et al., 1999; Wozniak et al., 2012).
- iv. mHealth-based application designed using the Open data kit technology. This prototype was developed by the principal investigator, by adapting the WHO standardized screening tools ASSIST and AUDIT by use of ODK technology.
- v. The researcher designed a paper-based tool adapted from ASSIST and AUDIT tools.
- vi. The researcher designed an interview schedule for peer mentors focused group discussion. This interview schedule was designed to elicit an in-depth understanding of the mHealth based peer mentoring experience by the peer mentors.

Data Collection Instruments for Baseline Survey

- i. A researcher-designed social demographic instrument, which captured the social-demographic characteristics of the study participants.

- ii. ASSIST, a tool to screen for multiple drug use, including tobacco and alcohol, had a standardized scoring and interpretation procedure which was followed to the letter. It has good psychometric properties and has been used across cultures (Wozniak et al., 2012).
- iii. The AUDIT, a tool for assessing for harmful use of alcohol. The AUDIT can also help identify alcohol dependence and specific consequences of harmful drinking. It is widely used in a range of health settings, but with suitable instructions, it can be self-administered or used by non-health professionals (Saunders et al., 1993).
- iv. Scale for the measurement of attitudes towards alcohol, the questionnaire was used to determine the attitude of the respondent towards alcohol. It was designed specifically to profile the risk of alcohol use among young consumers ages 18 to 26 years. The psychometric properties in terms of both reliability and validity are good (Francalanci et al., 2011). This is a 5-point Likert scale test and was scored accordingly.
- v. Rosenberg's self-esteem scale was used to determine how the respondents felt about themselves, it's a 4-point Likert scale. Higher scores denote high self-esteem and lower scores are for low self-esteem.

3.9 Ethical considerations

The approval to conduct this study was sought and granted by Kenyatta National Hospital and the University of Nairobi Ethical Committee (KNH-UoN ERC) P98/02/2018. Also, a research licence was obtained from NACOSTI, No: NACOSTI/P/20/5582.

Standard ethical research practices were maintained throughout this study. Explanations were done to all study participants and their informed written consent was obtained.

Those students who opted not to take part in this study suffered no discrimination as they continued to receive all the normal university ADA program services due to them.

Those who chose to participate in the study received no compensation. They could as well opt out of the study at any point they chose, without any consequences. There was no harm anticipated in participating in this study, however, a counsellor was available for intervention in case the need arose. Moreover, confidentiality was maintained at all levels of the research process and publications. No personal identifier data was recorded. Data codes were used for data collection, cleaning, and storage. This was meant to protect the identity of all participants. All participants were treated in a courteous and dignified manner.

3.10 Data Collection, Management and Analysis.

Phase 1 (a): Design of the mHealth-ODK based peer mentoring tool

This was the initial process of designing the mHealth-ODK based peer mentoring tool as described in section 3.6.

1(b) Prevalence survey

Determined the social demographics and prevalence of substance use among the university of Nairobi students. This was a quantitative survey using WHO standardized tools on alcohol and substance use. The sampling was done using the probability to population size (PPS) strategy. A randomization program (Random.org) was used to generate a list of class numbers to be approached for participation. The students whose numbers were randomly selected were then approached while in class, they got an explanation about the study and then they were requested for their written consent to participate in the survey.

Research questionnaires were then administered and after completion, they were collected, checked for completeness and then securely stored in a cabinet.

They were later reviewed for data cleaning and entry. This locked cabinet was under the custody of the principal investigator or an appointed representative.

Phase 2: The peer mentoring intervention phase

This was the peer mentoring intervention phase and data were collected from the interaction of peer mentors and their mentees. All contacts made by peer mentors in the mHealth-based group were guided in an algorithm format, using a prototype programmed by the PI in an ODK platform using a WHO-approved assessment tool for alcohol and substance involvement screening. The prototype was designed to ensure a structured step by step delivery of the peer mentoring process, as well as the completeness of data. In the case of missing information, the tool prompted the user to fill in the missing data before they could proceed. Also, if any responses that were outside the range of options were detected by the system, the mentor was prompted to correct the same immediately. This ensured that all the required information was filled in at once.

These sets of coded data were then transferred directly from the phone to a central open data kit server which was accessible to the principal investigator or a designee. The researcher reviewed the data for completeness. This data was backed up daily in a separate laptop and external hard disc. Twice a week the database was backed up on a read-only hard drive. It was secured by a password. Data from the peer mentors, from the comparative standard practice cohort, were collected by the use of a paper-based tool designed by the PI. These data were then compiled by the principal investigator who reviewed them for completeness. Complete data were coded and processed using EpiData software, they were then cleaned and analyzed using both descriptive and inferential methods using Stata software.

Both sets of data were secured by a password and were assessed only by the principal investigator or designee. For the qualitative phase, transcribed data were coded to themes and analyzed using qualitative data software (NVivo).

3.10.1 Data Analysis

Data were analyzed using both descriptive and inferential methods. The socio-demographic data for peer mentors which contained continuous data were summarized using measures of central statistics, thus they were presented as means with standard deviations while the categorical data were presented as frequencies and proportions.

The Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), and Feasibility of Intervention Measure (FIM) tools were analyzed and presented as frequencies and proportions. The tools were used for implementation outcome measures, and were essential for monitoring and evaluating the success of implementation efforts.

For the baseline survey, data were coded and entered using the EpiData 3.1 software; they were then checked for consistency and missing values. Incompletely filled questionnaires were dropped at this point. The cleaned data were then exported to Stata software. All statistical analyses were performed using Stata software version 14.2 Special Edition.

Appropriate questions were added together to indicate the prevalence of any alcohol or substance used in a lifetime and the past 3 months (current use). Summaries of the lifetime and current use prevalence and social demographic variables were done using descriptive statistics such as mean and mode. Associations between the outcome variables of a lifetime and current substance use and the independent variables such as sociodemographic characteristics were examined by calculating odds ratios.

The variables that were statistically significant at the $p < 0.05$ levels in bivariate analyses were used to create multivariable models.

Qualitative data of the study transcribed data was coded to themes and analyzed using the statistical software NVivo.

3.11 Study results dissemination

Results from the study were presented to the Department of Psychiatry, School of Medicine of the University of Nairobi.

The results were presented at international scientific conferences:

1. Design and Development of a Mobile Phone-Based Decision Support app. for Substance Use Screening and Referral in a resource Limited University Setting, at the Society for Prevention Research 27th Annual Meeting, Hyatt Regency, San Francisco, CA, Tuesday, May 28, 2019 - Friday, May 31, 2019.
2. Prevalence & Patterns of Substance Use in First-Year University Students at the 7th Annual Joint Advanced Seminar (JAS 4) conference at Makerere University, Kampala 18 March 2020.
3. Psychoactive substance use among first-year students at the University of Nairobi, Kenya: Prevalence and Patterns at the CARTA @10 dissemination scientific conference 03-04 December 2020, Virtual Meeting.

Two scientific paper publications in peer review journals have also been published from the results of this study while a third manuscript and a draft policy brief are under peer review:

1. 'mHealth-based peer mentoring for prevention of alcohol and substance abuse among first-year university students: protocol for quasi-experimental intervention, Journal of Substance Use, DOI: 10.1080/14659891.2020.1766131

2. Alcohol and substance use among first-year students at the University of Nairobi, Kenya: Prevalence and patterns. PLoS ONE 15(8): e0238170. <https://doi.org/10.1371/journal.pone.0238170>
3. Student Peer Mentoring: Feasibility and Acceptability of mHealth-based tool for Alcohol and Substance Abuse Prevention at a University in Kenya. (Under Peer Review).
4. Alcohol and drug abuse prevention: A call to revise the alcohol and drugs prevention policy of the University of Nairobi (Draft Policy Brief under peer review)

The results as well as the publications were shared with the University of Nairobi library, the University of Nairobi repository and the KNH-UoN ethics and research committee and NACOSTI.

3.12 Limitations of the study

- i. Being a prospective study some study participants (peer mentors lost interest) thus were lost to natural attrition. To circumvent this limitation; the researcher recruited a slightly larger sample size to accommodate the ones who dropped out of the study.
- ii. Peer mentors who did not have android phones were not recruited to participate in the study. ODK program works only with android based smartphones, so those students who had apple-based smartphones were not recruited to participate even when they were willing.
- iii. The baseline survey being a self-report the respondents may have given socially desirable responses thus with a potential for over or under-reporting of the prevalence of alcohol and substance use.

- iv. The campuses of intervention were different in location, this could have affected the results because different university campuses tend to have varying student cultures and habits. The peer mentoring procedures were different and thus this could compound the study results.

3.13 Study closure plan and procedure

After collection and analysis, the findings of the study were presented at the Department of Psychiatry, University of Nairobi. The control group were introduced to peer mentoring by use of a mHealth-based practice.

The principal investigator wrote a policy brief for the University of Nairobi to review the existing University of Nairobi Alcohol and Drugs Prevention Policy and adopt the mHealth-based peer mentoring and to have it included in the policy.

The PI organized continuous public engagement and dissemination sessions with the university counsellors and university students who were sensitized on the use of mHealth-based decisional support for peer mentoring.

CHAPTER FOUR

4.0 RESULTS/ FINDINGS

Introduction

This was done in three phases, in phase one there was the design and creation of a mHealth-based decision support tool for peer mentoring among university students. Before the intervention was implemented, a baseline survey was conducted to document the attitudes and prevalence of alcohol and substance use among first-year university students. For the baseline survey, 406 study participants were recruited from the two study campuses. In Phase two of the study, the sample size was 100 student peer mentors of which 51 were from the campus which used the mHealth-based peer mentoring and 49 were from the campus that participated in the standard practice. These peer mentors were followed up for 6 months.

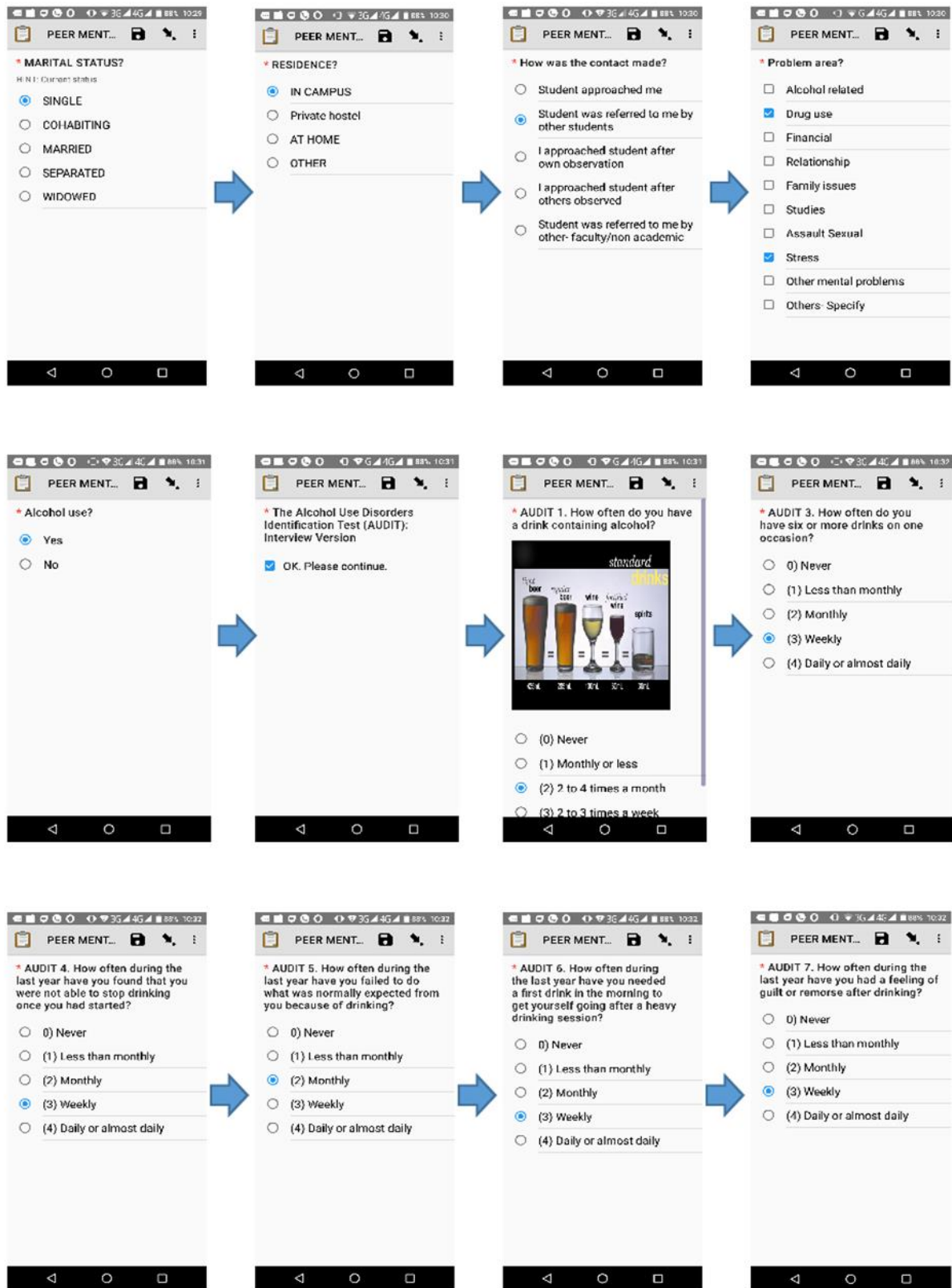
4.1 To design and create a mHealth-based decision support tool for substance use screening, brief intervention and referral

To meet the overall objective of this study we designed and created a mHealth-based decision support tool for substance use screening, brief intervention and referral. The mHealth app was developed using Open Data Kit (ODK), ODK is open-source software that has been used to design and develop android-based mobile health applications, the software can implement skip logics, validation checks and algorithm-based decision support (Loola Bokonda et al., 2020; Macharia et al., 2013). To design the mHealth app, the Alcohol Use Disorders Identification Test (AUDIT) and the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST V3.0) which are WHO approved tools for substance use disorders screening in general population were programmed into ODK.

Inbuilt algorithms were programmed to calculate students' specific substance scores, these scores then determined the pathway for brief intervention or referral and linkage to care and support by the mHealth app. Screen-by-screen questions based on AUDIT and ASSIST were accessed in the mHealth app, the process of responding to these questions were either administered by the mentors or each mentee could self-administer the questions. The ODK systems were customized to have an in-built capacity for real-time transfer of interaction data/information and intervention actions between peer mentor and mentee to a central server set up specifically for the study, this central server was accessible to the PI.

The prototype is shown in figure 3 below.

FIGURE 3: mHEALTH-BASED DECISION SUPPORT PROTOTYPE



4.1 To describe the social demographic characteristics of the Study Respondents

The respondents to the survey were from two campuses of the University of Nairobi. Out of the 440 students approached to participate in the study, 406 (92.3%) students agreed and consented.

Table one below shows the social demographic characteristics of the study respondents.

TABLE 1: SOCIAL DEMOGRAPHIC CHARACTERISTICS OF THE STUDY PARTICIPANTS

Variable	Frequency n=406	Percentage %
Age (years)		
18-21	385	94.8%
22-25	21	5.2%
Sex		
Male	206	50.7%
Female	200	49.3%
Faculty		
Education	184	45.3%
Physical Science	116	28.6%
Mathematics	46	11.3%
Computer	22	5.4%
Biological science	19	4.7%
Biotechnology	19	4.7%
Mode of sponsorship		
Government	371	91.4%
Self	35	8.6%
Marital Status		
Single	398	98.0%
Not single	8	2.0%
Residence		
Campus hostels	318	78.5%
Private hostels	25	6.2%
Home	62	15.3%

The socio-demographic characteristics of the study respondents was a male or female student in equal ratio, aged averagely 19 years (range of 18-25 years).

The majority were students in the faculties of education and physical sciences and most were government-sponsored (91.4%). Three out of every four respondents stayed in university accommodation and almost all of them were unmarried (98%).

4.2 To determine first-year students’ prevalence of and attitude towards alcohol and substance use at admission to the university

4.2.1 The prevalence of substance use among the respondents

Table 2 shows the prevalence of substance use among the respondents

TABLE 2A: PREVALENCE OF SUBSTANCE USE AS DESCRIBED BY WHO ASSIST V3

Substance	Lifetime Use	Current Use	Temporal frequency of current use (Use within last 3 months)				
	Frequency (%)	Frequency (%)	Never Frequency (%)	Twice or more a month Frequency (%)	Monthly Frequency (%)	Weekly Frequency (%)	Daily Frequency (%)
Alcohol	89 (21.9)	69 (17.0)	337 (83)	42 (10.3)	15 (3.7)	8 (2)	4 (1)
Cannabis	33 (8.1)	28 (6.9)	385 (94.8)	14 (3.4)	1 (0.2)	6 (1.5)	1 (0.2)
Tobacco	28 (6.9)	21 (5.2)	383 (94.8)	17 (4.2)	1 (0.2)	3 (0.7)	3 (0.7)
Sedative	21 (5.2)	21 (3.5)	392 (96.6)	10 (2.5)	3 (0.7)	1 (0.2)	1 (0.2)
Hallucinogens	9 (2.2)	10 (2.2)	396 (97.5)	8 (2)	1 (0.2)	1 (0.2)	0 (0)
Cocaine	8 (2.0)	6 (1.5)	400 (98.5)	2 (0.5)	2 (0.5)	0 (0)	2 (0.5)
Inhalants	5 (1.2)	5 (1.2)	401 (98.8)	5 (1.2)	0 (0)	0 (0)	0 (0)
Amphetamine	4 (1.0)	5 (1.2)	401 (98.8)	4 (1)	1 (0.2)	1 (0.2)	0 (0)
Opioids	2 (0.5)	2 (0.5)	404 (99.5)	1 (0.2)	1 (0.2)	1 (0.2)	0 (0)
Injection Use	33(8.1)	4 (1)	402 (99)	4 (1)	0 (0)	0 (0)	0 (0)

One in every four respondents had used a substance of abuse in their lifetime (95% CI:21.2, 29.9).

This was most likely to be alcohol (21.9%) or cannabis (8.1%).

The prevalence of current substance use was 20.4% (95% CI: 16.6, 24.7). Alcohol was also the most currently used substance of abuse (17%) and most alcohol users drank once or twice a month as opposed to daily use. The alcohol, cannabis and tobacco current use pattern had daily usage reported and this is of concern to everyone concerned due to their known high addictive capabilities. About 5% of the respondents used sedatives and 8.1% had used a drug by injection, these students should receive due attention given the negative consequences of substance use.

Alcohol Use Risk Assessment as described in AUDIT

TABLE 2B: ALCOHOL USE DISORDER RISK AS DESCRIBED IN AUDIT

Variable	Frequency n=406	Percentage (%)
Low risk	386	95.07%
Alcohol-related problem	66	16.26%
Risky alcohol use	16	3.94%
Dependence/addiction	7	1.72%
Harmful alcohol	3	0.74%
Need intervention	4	1.0%

Assessment using the AUDIT found 66 (16.3%) study respondents with alcohol use problems including cravings, withdrawal symptoms and neglect of major role obligation. A further 0.74% of the study respondents had a harmful pattern of alcohol consumption, which was denoted by high scores on all the domains of functioning while 1.7% were alcohol dependent. Furthermore, 16 (3.9%) showed a high risk of experiencing negative consequences related to alcohol use in terms of their health, social relationships, legal situation and finances. 1.0% of the respondents needed intervention for alcohol use disorder. (Table 2b)

4.2.2 Association of socio-demographic characteristics and Ever use of substance use

TABLE 3: ASSOCIATION OF SOCIAL-DEMOGRAPHIC CHARACTERISTICS AND EVER USE SUBSTANCE USE

Variable	Bivariate			Odds Ratio		
	Ever use substance use		Chi-square P-value	Adjusted		
	Absent Freq. (Row %)	Present Freq. (Row %)		Odds Ratio	P-value	[95% Conf. Interval
Age			0.016			
18-21	292 (75.8)	93 (24.2)		1		
22 to 25	11 (52.4)	10 (47.6)		2.339	0.081	0.902 6.066
Sex			0.014			
Male	143 (69.4)	63 (30.6)		1		
Female	160 (80.0)	40 (20.0)		0.572	0.026	0.349 0.936
School Enrolled			0.001			
Physical science	88 (75.9)	28 (24.1)		1		
Mathematics	38 (82.6)	8 (17.4)		0.711	0.453	0.292 1.733
Biological science	9 (47.4)	10 (52.6)		3.047	0.041	1.049 8.855
Computer	12 (54.5)	10 (45.5)		1.832	0.241	0.667 5.033
Education	146 (79.3)	38 (20.7)		0.892	0.7	0.5 1.592
Biotechnology	10 (52.6)	9 (47.4)		2.163	0.164	0.729 6.417
Mode of sponsorship			0.004			
Public-sponsored	284 (76.5)	87 (23.5)		1		
Private-sponsored	19 (54.3)	16 (45.7)		1.325	0.525	0.556 3.155
Marital status			0.106			
Single	299 (75.1)	99 (24.9)		1		
Not single	4 (50)	4 (50)		1.965	0.423	0.377 10.248
Residence			0.001			
Campus	250 (78.6)	68 (21.4)		1		
Private	13 (52)	12 (48)		2.236	0.094	0.871 5.742
Home	39 (62.9)	23 (37.1)		1.426	0.35	0.678 2.999

The study assessed factors associated with ever use substance use, the bivariate is shown in Table 3. It was observed that at the bivariate level, age, gender, faculty, mode of study and residence were statistically significantly associated with a lifetime use.

The odds of lifetime substance use were double among those aged 22 years and above compared to those aged 18 to 21 years (p-value<0.05).

There was a higher proportion of participants aged 20 years and above who reported having ever used substances compared to those below 20 years (47.6% vs 24.2%). In terms of gender, there was a higher proportion of male (30.6%) substance users compared to females (20.0%). Also, privately-sponsored students used substances more than publicly-sponsored students (45.7% vs 23.5%).

However, the study results found that adjusting for other variables the only factor associated with lifetime use was sex. Females had reduced odds of using substances compared to males, their odds were half the odds of lifetime use compared to males (p-value=0.026).

4.2.3 Problems related to substance use among the study respondents

TABLE 4: PROBLEMS RELATED TO CURRENT SUBSTANCE USE AS DESCRIBED IN THE WHO ASSIST V3 (N=83)

Variable (Problem)	Frequency	Percentage (%)
Urge to use (cravings)	60	72.3
Concerns raised by others due to the use	37	44.6
Health problems due to use	31	37.3
Struggled with quit	30	36.1
Duty limitation due to use	24	28.9

Cravings or the urge to engage in alcohol and substance use was the most reported problem with 60 (72.2%) of the respondents. This was followed by substance use-related problems of health, social, legal or financial nature which were reported by 31(37.3%) respondents while in the third-place 24 (28.9 %) respondents had failed to attend to their major role obligations due to their use of substances. (Table 4)

4.2.4 Attitude towards substance use

TABLE 5: ASSOCIATION BETWEEN ATTITUDE, SOCIO-DEMOGRAPHICS AND PREVALENCE OF SUBSTANCE USE

Variable	Bivariate				Multivariate			
	Attitude		Chi-square p-value	Adjusted Odd ratio	P-value	[95% Interval	Conf.	
	Negative Freq. (%)	Positive Freq. (%)						
Age categories	0.297							
18-21	231 (60)	154 (40)		1				
22 to 25	15 (71.4)	6 (28.6)		0.703	0.497	0.255	1.942	
Sex	0.868							
Male	124 (60.2)	82 (39.8)		1				
Female	122 (61)	78 (39)		0.998	0.992	0.658	1.514	
School Enrolled	0.762							
Physical science	72 (62.1)	44 (37.9)		1				
Mathematics	26 (56.5)	20 (43.5)		1.145	0.705	0.568	2.307	
Biological science	13 (68.4)	6 (31.6)		0.857	0.782	0.286	2.567	
Computer	11 (50)	11 (50)		2.215	0.118	0.817	6.004	
Education	114 (62)	70 (38)		0.915	0.722	0.560	1.495	
Biotechnology	10 (52.6)	9 (47.4)		2.181	0.161	0.734	6.484	
Mode of sponsorship	0.036							
Public-sponsored	219 (59)	152 (41)		1				
Private-sponsored	27 (77.1)	8 (22.9)		0.330	0.023	0.126	0.861	
Marital status	0.4							
Single	240 (60.3)	158 (39.7)		1				
Not single	6 (75)	2 (25)		0.312	0.305	0.034	2.885	
Residence	0.736							
Campus	190 (59.7)	128 (40.3)		1				
Private	16 (64)	9 (36)		0.980	0.967	0.385	2.495	
Home	40 (64.5)	22 (35.5)		0.922	0.816	0.466	1.824	

*Significance at $p \leq 0.05$

The mean attitude score was 27.18 (standard deviation=9.37) with a range of between 0 and 45. Using a negative attitude upper cut-off score of 30 we observed that 160 (39.41%) had a positive attitude to substance use. The study assessed for factors associated with attitude towards substance use and at a bivariate level, we observed that mode of sponsorship, current use, lifetime use were associated with attitude (p-value <0.05).

Those on government sponsorship were more likely to have a positive attitude (41%) compared to private-sponsored (23%). A higher proportion of those currently not using any substance was more likely to have a positive attitude. Adjusting for other variables mode of sponsorship and lifetime substance were statistically significantly associated with attitude. The odds of having a positive attitude towards alcohol among those on self-sponsorship was 0.34 times that of those on government sponsorship (p-value=0.034). For those who reported lifetime use of substances their odds of having a positive attitude was 0.22 times that of those who had no lifetime substance use (p-value=0.042).

4.3 To determine the acceptability of the use of mHealth based decision support tool among peer mentors.

4.3.1 Social demographic characteristics of peer mentors

The social demographic distribution of peer mentors is presented in table 6

TABLE 6: SOCIAL DEMOGRAPHIC CHARACTERISTICS OF PEER MENTORS

Variables (Social demographics)	Chiromo (Intervention) (N=51)	Kikuyu (Standard practice) (N=49)	Total (N=100)
Age, yrs			
18-21	43 (84.3%)	47 (95.9%)	90 (90.0%)
22 to 25	8 (15.7%)	2 (4.1%)	10 (10.0%)
Mean (SD)	19.275 (3.014)	19.510 (1.157)	19.390 (2.291)
Range	18.000 - 25.000	18.000 - 23.000	18.000 - 25.000
Sex			
Male	31 (60.8%)	23 (46.9%)	54 (54.0%)
Female	20 (39.2%)	26 (53.1%)	46 (46.0%)
Marital status			
Single	50 (98.0%)	48 (98.0%)	98 (98.0%)
Not single	1 (2.0%)	1 (2.0%)	2 (2.0%)
Residence			
Campus	39 (76.5%)	47 (95.9%)	86 (86.0%)
Private	5 (9.8%)	1 (2.0%)	6 (6.0%)
Home	7 (13.7%)	1 (2.0%)	8 (8.0%)
Mode of sponsorship			
Public	46 (90.2%)	48 (98.0%)	94 (94.0%)
Private	5 (9.8%)	1 (2.0%)	6 (6.0%)

*Significance at $p \leq 0.05$

One hundred peer mentors participated in the peer mentoring intervention program. Of these, 51 were from the mHealth-based intervention campus. Overall males accounted for 54% of the peer mentor. The mean age of the peer mentors was 19.4 (standard deviation=2.3) and it did not differ significantly between the two campuses. The overall majority (86%) of the peer mentors, resided in on-campus accommodation.

4.3.2 Acceptability of peer mentoring intervention by the peer mentors

TABLE 7: ACCEPTABILITY OF INTERVENTION MEASURE (AIM TOOL)

	Chiromo mHealth Intervention (N=51)	Kikuyu Standard care (N=49)	Total (N=100)	p value
Acceptability				0.145
Accept	51 (100.0%)	47 (95.9%)	98 (98.0%)	
Neutral	0 (0.0%)	2 (4.1%)	2 (2.0%)	
Appropriateness				0.316
Accept	47 (92.2%)	48 (98.0%)	95 (95.0%)	
Below	2 (3.9%)	0 (0.0%)	2 (2.0%)	
Neutral	2 (3.9%)	1 (2.0%)	3 (3.0%)	
Feasibility				0.374
Accept	44 (86.3%)	45 (91.8%)	89 (89.0%)	
Neutral	7 (13.7%)	4 (8.2%)	11 (11.0%)	
Resources				0.242
Available	44 (86.3%)	37 (75.5%)	81 (81.0%)	
Not available	4 (7.8%)	4 (8.2%)	8 (8.0%)	
Neutral	3 (5.9%)	8 (16.3%)	11 (11.0%)	
Usefulness				0.999
Useful	49 (96.1%)	47 (95.9%)	96 (96.0%)	
Not useful	1 (2.0%)	1 (2.0%)	2 (2.0%)	
Neutral	1 (2.0%)	1 (2.0%)	2 (2.0%)	
Ease of use				0.223
Easy	48 (94.1%)	46 (93.9%)	94 (94.0%)	
Not easy	3 (5.9%)	1 (2.0%)	4 (4.0%)	
Neutral	0 (0.0%)	2 (4.1%)	2 (2.0%)	
Attitude				0.325
Positive	50 (98.0%)	49 (100.0%)	99 (99.0%)	
Negative	1 (2.0%)	0 (0.0%)	1 (1.0%)	
Intention				0.325
Positive	50 (98.0%)	49 (100.0%)	99 (99.0%)	
Negative	1 (2.0%)	0 (0.0%)	1 (1.0%)	

*Significance at $p \leq 0.05$

The acceptability of the peer mentoring program was high in both groups and did not differ significantly between the mHealth-based group (100%) and the standard practice (96%) group. Peer mentors in both groups indicated that the program was appropriate. There was no statistically significant difference between the mHealth-based and standard practice groups in terms of their attitude towards peer mentoring because 98% of peer mentors from the mHealth-based group and 100% of those from the standard practice group had a positive attitude towards peer mentoring and intended to continue to use it. Eighty-six per cent (86%) of peer mentors from the mHealth-based group found the intervention feasible and reported that they had the resources needed to implement it, while 91.8% of those from the standard practice group found it feasible and 75.5% reported that they had the resources required to implement their program.

4.4: To determine the reach (number of contacts between peer mentors and students) in the mHealth-based group as compared to the standard practice group.

4.4.1 Characteristics of the mentees

Table 8 presents the social-demographic characteristics of the mentees reached by peer mentors.

TABLE 8: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE MENTEES

Variable	Campus		p-value
	mHealth-based	Standard practice	
	Freq (Col %)	Freq (Col %)	
Gender			0.789
Male	266 (60.5)	59 (59)	
Female	174 (39.5)	41 (41)	
Year of Study			<0.001
1	115 (26.1)	9 (9)	
2	164 (37.3)	81 (81)	
3	80 (18.2)	10 (10)	
4	81 (18.4)	0 (0)	
Mode of sponsorship			0.421
Public	383 (87)	84 (84)	
Private	57 (13)	16 (16)	
Marital Status			0.001
Single	355 (86.2)	98 (98)	
Married/ Cohabiting	57 (13.8)	2 (2)	
Residence			0.002
Campus	309 (70.2)	86 (86)	
Private	51 (11.6)	11 (11)	
Home	52 (11.8)	2 (2)	
Other	28 (6.4)	1 (1)	

The majority of the mentees in both groups were male, who was publicly sponsored (87% in mHealth-based and 84% in standard practice campuses) and they resided in campus residence (Table 8). Most of the mentees were in their second year of study. Comparing the two campuses there was no significant difference in the gender of the students who sought help (p-value=0.789).

Mentees reached

A total of 540 (60% males) mentees were reached in the two campuses. In the mHealth-based campus, the mentors reached a total of 440 mentees, while in the standard of care cohort 100 mentees were reached. The mean number of mentees per mentor in the mHealth-based group was 8.62 (std=13.04) with a range of (1, 76) while that in the standard practice cohort was 8.33 (std=4.40) with a range of (3,19).

Peer mentors from the mHealth-based campus organised 10 sensitization sessions on campus which had a combined attendance of 280 students. While in the standard practice campus 6 sensitization sessions were conducted with a total attendance of 148 students.

4.4.2: Contacts made and the problems as identified by the peer mentors

A summary of the number of contacts and problems identified by the peer mentors is presented in table 9

TABLE 9: CONTACTS MADE AND THE PROBLEMS AS IDENTIFIED BY THE PEER MENTORS

Variable	Campus		p-value
	Chiromo (mHealth- based group)	Kikuyu (Standard care)	
	Freq (Col %)	Freq (Col %)	
How to contact was made			<0.001
Mentor initiated	186 (42.5)	70 (70)	
Mentee initiated	135 (30.8)	16 (16)	
External referral	117 (26.7)	14 (14)	
Problems identified			
Alcohol use			<0.001
No	224 (50.9)	74 (74)	
Yes	216 (49.1)	26 (26)	
Other substances use			<0.001
No	315 (71.6)	90 (90)	
Yes	125 (28.4)	10 (10)	
Finance problems			0.004
No	349 (79.3)	66 (66)	
Yes	91 (20.7)	34 (34)	
Intimate Relationships			0.376
No	356 (80.9)	77 (77)	
Yes	84 (19.1)	23 (23)	
Family relationships			0.837
No	402 (91.4)	92 (92)	
Yes	38 (8.6)	8 (8)	
Academic difficulties			0.112
No	387 (88)	82 (82)	
Yes	53 (12)	18 (18)	
Sexual Assault			0.095
No	428 (97.3)	100 (100)	
Yes	12 (2.7)	0 (0)	
Stress			0.321
No	366 (83.2)	79 (79)	
Yes	74 (16.8)	21 (21)	

*Significance at $p \leq 0.05$

Most of the contacts between peer mentors and their mentees were established by the peer mentors based on reports they received concerning potential student mentees, as indicated by 43% in the mHealth-based group and 70% in the standard practice group.

Up to 31% of the mentees in mHealth-based campus (Chiromo) and 16% in the standard practice campus (Kikuyu) made the initiative to seek help from the peer mentors. 49% of the mentees in the mHealth-based campus had alcohol-related problems while 28% had problems with a combination of alcohol and other substances. In the standard practice campus, 26% of the mentees had alcohol-related problems while 10% had a combination of alcohol and other substance problems. There were significant differences in the presented problems of alcohol and other substances between the two campuses (p-value=0.001) (Table 9).

4.4 To determine the patterns of alcohol and substance use among the mentees

4.4.1: Patterns of lifetime substance use as identified by the peer mentors

Table 10 presents the patterns of substance use among the mentees in the two campuses.

TABLE 10: LIFETIME ALCOHOL AND SUBSTANCE USE AMONG THE STUDENT MENTEES

Substance	Campus		P-value
	Chiromo (mHealth- based)	Kikuyu (Standard practice)	
	Freq (Col %)	Freq (Col %)	
Tobacco			<0.001
No	89 (50.3)	89 (89)	
Yes	88 (49.7)	11 (11)	
Alcohol			<0.001
No	44 (24.9)	59 (59)	
Yes	133 (75.1)	41 (41)	
Cannabis			<0.001
No	69 (39)	93 (93)	
Yes	108 (61)	7 (7)	
Cocaine			<0.001
No	143 (80.8)	99 (99)	
Yes	34 (19.2)	1 (1)	

Amphetamine			<0.001
No	142 (80.2)	100 (100)	
Yes	35 (19.8)	0 (0)	
Inhalant			<0.001
No	138 (85.2)	100 (100)	
Yes	24 (14.8)	0 (0)	
Sedatives			<0.025
No	129 (73.3)	85 (85)	
Yes	47 (26.7)	15 (15)	
Hallucinogens			<0.001
No	133 (78.2)	100 (100)	
Yes	37 (21.8)	0 (0)	
Opioids			<0.001
No	139 (79.4)	100 (100)	
Yes	36 (20.6)	0 (0)	

*Significance at $p \leq 0.05$

Among the mentees in the mHealth-based campus lifetime prevalence of alcohol was 75% (n=177) while in the standard practice cohort the prevalence was 41% (n=100). We observed that there was a statistically significant difference in the patterns of substance use between the two campuses (p-value<0.005) (Table 10). There was a significant difference in the prevalence of alcohol use in the mHealth-based campus and the standard practice campus $p < 0.001$. Cannabis was used by 61% (n=177) of the mentees in the mHealth-based campus and by 7% (n=100) of mentees in the standard practice campus. About 50% of mentees in mHealth-based campus used tobacco, as compared to 11% of those from the standard practice campus. Sedatives were used by 26.7% (n=177) of the mentees in the mHealth-based campus as compared to 15% (n=100) of those from the standard practice campus.

4.4.2: Patterns of current substance use among the mentees

Table 11 presents the patterns of current substance use among the mentees from both mHealth-based intervention and the standard practice campuses

TABLE 11: CURRENT (USE IN PAST 3 MONTHS) SUBSTANCE USE AMONG MENTEES (ASSIST)

Substance	Campus		P-value
	Chiromo (mHealth-based)	Kikuyu (Standard practice)	
	Freq (Col %)	Freq (Col %)	
Tobacco			<0.001
Never	13 (14.8)	93 (93)	
Once	29 (33)	2 (2)	
Monthly	12 (13.6)	2 (2)	
Weekly	16 (18.2)	2 (2)	
Daily	18 (20.5)	1 (1)	
Alcohol			<0.001
Never	2 (1.5)	60 (60)	
Once	46 (34.6)	20 (20)	
Monthly	27 (20.3)	6 (6)	
Weekly	44 (33.1)	10 (10)	
Daily	14 (10.5)	4 (4)	
Cannabis			<0.001
Never	20 (18.5)	94 (94)	
Once	21 (19.4)	1 (1)	
Monthly	25 (23.1)	1 (1)	
Weekly	31 (28.7)	2 (2)	
Daily	11 (10.2)	2 (2)	
Cocaine			<0.001
Never	8 (23.5)	99 (99)	
Once	12 (35.3)	1 (1)	
Monthly	6 (17.6)	0 (0)	
Weekly	4 (11.8)	0 (0)	
Daily	4 (11.8)	0 (0)	
Amphetamine			<0.001
Never	12 (34.3)	100 (100)	
Once	7 (20)	0 (0)	
Monthly	4 (11.4)	0 (0)	
Weekly	7 (20)	0 (0)	
Daily	5 (14.3)	0 (0)	
Inhalant			
Never	3 (7.9)		
Once	6 (15.8)		
Monthly	1 (2.6)		

Weekly	2 (5.3)		
Daily	26 (68.4)		
Sedatives			<0.001
Never	7 (17.9)	89 (89)	
Once	14 (35.9)	6 (6)	
Monthly	5 (12.8)	2 (2)	
Weekly	2 (5.1)	2 (2)	
Daily	11 (28.2)	1 (1)	
Hallucinogens			<0.001
Never	10 (22.7)	100 (100)	
Once	9 (20.5)	0 (0)	
Monthly	5 (11.4)	0 (0)	
Weekly	7 (15.9)	0 (0)	
Daily	13 (29.5)	0 (0)	
Opioid			<0.001
Never	4 (15.4)	100 (100)	
Once	4 (15.4)	0 (0)	
Monthly	6 (23.1)	0 (0)	
Weekly	9 (34.6)	0 (0)	
Daily	3 (11.5)	0 (0)	

*Significance at $p \leq 0.05$

When compared, current substance use between the two campuses was observed to be of a similar trend to that of lifetime use with a higher proportion in the mHealth-based campus. The difference was statistically significant across all the substances with up to 20% (n=88) of the mentees who used tobacco in mHealth-based campus did so daily, while 18% (n=88) used weekly. While in standard practice campus, 1% of tobacco users did so daily and 2% used tobacco weekly. As pertains alcohol use, 10% (n=133) of mentees in mHealth-based campus drank daily while 33% (n=133) did so weekly, also, 50% (n=133) of the mentees drank alcohol at least once per month. In the standard practice campus, 4% (n=100) of the mentees drank alcohol daily, 10% drank weekly and 26% drank at least once per month. Cannabis was used daily by 11% (n=108) of the mentees in the mHealth-based group, while 29% did so weekly and 43% monthly. In the standard practice, campus cannabis was used daily and weekly each by 2% (n=100) of the mentees.

4.4.3: Patterns of alcohol use among the mentees, as identified by the peer mentors

The patterns of alcohol use among the mentees are presented in Table 12

TABLE 12: RISK ASSESSMENT FOR ALCOHOL USE DISORDERS BY MENTEES (AUDIT)

Audit	Campus		P-value
	Chiromo (mHealth- based)	Kikuyu (Standard practice)	
	Freq (%)	Freq (Col %)	
Harmful			<0.001
No	264 (81.5)	95 (95.0)	
Yes	60 (18.5)	5 (5.0)	
Dependence			<0.001
No	138 (58.2)	95 (95.0)	
Yes	99 (41.8)	5 (5.0)	
Alcohol-related problems			<0.001
No	16 (6.7)	80 (80.0)	
Yes	221 (93.3)	20 (20.0)	
Risk			<0.001
Low	34 (14.3)	83 (83.0)	
Risky	76 (32.1)	8 (8.0)	
High	32 (13.5)	4 (4.0)	
Need Intervention	95 (40.1)	5 (5.0)	

*Significance at $p \leq 0.05$

Mentees from the mHealth-based campus had a higher pattern of harmful use of alcohol at 19% as compared to 5% of mentees from standard care campus as exemplified by scores of 8-14 points of the AUDIT screening. There was a higher proportion of mentees with alcohol-related problems in the mHealth-based campus 93% (n=237) as compared to 20% (n=100) of in standard practice campus. Similarly, 40% of mentees from the mHealth-based campus needed intervention for substance use disorders compared to 5% of those from the standard practice campus (Table 12).

4.5 To evaluate the intervention options taken by all peer mentors

4.5.1 Awareness and sensitization sessions by peer mentors from the Kikuyu campus

TABLE 13: ACTIONS TAKEN BY PEER MENTORS: STANDARD PRACTICE CAMPUS (KIKUYU)

Support	Freq	%
Non-ADA related problem support		
Brief counselling	58	58
Advice given	49	49
Referred for care	10	10
ADA related problem support		
Brief counselling	43	43
Referred for care	23	23
Given IEC materials	22	22
Support group	6	6
Emailed IEC materials	5	5

Mentees in standard practice campus presented with alcohol and drug abuse (ADA) related problems as well as others with Non-ADA related concerns. Brief counselling was offered to 58% (n=100) of the mentees who sought counselling services for non-ADA related problems, and 43% of those with ADA problems. While advice was given to 49% of the mentees. Moreover, 27% of the mentees with ADA problems received relevant information, education and communication (IEC) materials on alcohol and drugs education. Up to 33% of mentees were referred for more intensive interventions in the systems available at the university. In the standard practice campus, 75% (n=100) of the mentees were followed up more than once.

TABLE 14: ACTION TAKEN BY PEER MENTORS AT MHEALTH-BASED INTERVENTION CAMPUS (CHIROMO)

Single Intervention	Frequency	%
Brief counselling	61	59.8
Referral to other services	21	20.59
Screening only	20	19.61
	102	
Multiple interventions	Frequency	%
Brief counselling	216	65.85
Brief counselling sent IEC materials	34	10.37
Brief counselling, sent IEC materials, support group	17	5.18
Brief counselling, support group	18	5.49
Sent materials	30	9.15
Support group	11	3.35
Sent materials, support group	2	0.61
Referral	Frequency	%
No	129	56.83
Yes	98	43.17
AUDIT screening at initial contact	Frequency	%
Screening for intervention only	173	53.05
Receive brief intervention	132	40.24
More intensive treatment	22	6.71
AUDIT screening at follow-up	Frequency	%
Screening for intervention only	126	38.42
Receive brief intervention	146	44.52
More intensive treatment	56	17.07

Up to 79% (n=440) of mentees in the mHealth-based campus had multiple contacts with their peer mentors.

Peer mentors in the mHealth-based campus used brief counselling intervention for up to 60% of the cases with their mentees. Besides, 43% of mentees were referred for specialized counselling services within the university systems.

4.6: To document the experiences of peer mentors

We conducted four focussed group discussions with peer mentors from both the mHealth-based campus and the standard practice campus. We used a similar interview guide for both groups.

Data were analysed using NVivo software and 7 themes emerged deductively:

1. Experience of peer mentors with the mentoring process

All the peer mentors reported that peer mentoring was a good and interesting experience for them. “I have moved; it was a great step for me.” One of them said. She also reported that; “I feel lucky to have been exposed to this program right from first-year, I am also the youngest in the group, I have a lot of time still in campus, I am looking forward to continuing to grow, to experience bigger and better things.” (female peer mentor, 18 years)

“I enjoyed to help my peers, I mastered all the mentoring process and the questions and the materials I had on Alcohol and Drug Abuse education came in very handy.” (male peer mentor, 22 years)

“I have learnt a lot about the issues affecting young people nowadays, I now share innovative solutions with other peers in different forums, I appreciate the partnership of my fellow peer mentors in the mentoring process.” (20 years old male peer mentor, 20 years)

“The knowledge I gained helps me during informal interactions I used the information gained from the peer mentoring program, this helped my interactions with peers and I offered solutions to their problems and I felt proud of myself.” (female peer mentor, 23 years)

The mentors reported that as students they were also role models to others in their villages as well and that the program helped impact them with the right skills.

Peer mentors were role models of good behaviour on campus and the program helped to shape the students' experiences on campus, it helped many students stop using drugs. Furthermore, the mentors reported that the mentees gave feedback that they found the peer mentors more accessible than staff members and that the peer mentors acted as a bridge between students and staff members.

A 22-year-old female peer mentor said that; “As peer mentors, we organized student events on campus like on Valentine’s Day, World Condom Day and the International Day against Drug Abuse and Illicit Drug Trafficking, these events were meant to create awareness in campus about various life issues affecting the students.”

A 20-year-old male peer mentor reported that “the consenting process was the most difficult part of the whole process, the mentor had to give a lot of assurance that the information was strictly confidential and would not be shared with others, but once they gained the trust, the rest of their interactions were easier.”

Overall all peer mentors felt that peer mentoring was a good experience for their peers as well. They reported that most of the mentees were positive about the whole process and that mentees were happy to be engaged in the peer mentoring process.

“They wanted to know more about the intervention, they wanted to know more about the effects of drug use, the mentees felt that someone was listening to them.” (male peer mentor, 21 years).

A 23-year-old female peer mentor had this to say, “Some mentees were curious to know more about the intervention and effects of drug use and some mentees also reported that mentoring had a big impact on them.”

The peer mentors reported that the peer mentoring program made the mentees know about the services that are available at the university. However, most of the mentees did not want to be referred, they preferred to deal with only the mentor as they preferred to remain anonymous. “The mentees had a notion that referral to University Health Services was for those who could not do anything for themselves, those whose case was very bad.” (Male peer mentor, 24 years).

2. Opportunities for personal learning, growth and development

Peer mentoring was an opportunity for personal growth and development for most of the peer mentors. They reported that they improved their networks during peer mentoring interactions. “I have grown socially, I met and interacted with many people, and the opportunity to know people from diverse places, I improved my networks, your networks are your net worth, I met different stakeholders like UNESCO among others and this opened other great opportunities for me” (male peer mentor, 24 years).

Some peer mentors got opportunities to attend conferences and interact with other youth on international forums. “I used my experience of peer mentoring to create a mobile ‘app’ and through this, I attended 2 international conferences, where I met people from across the globe, also I got the opportunity to attend many other platforms and university events and I have gained a lot working with other clubs on campus. We used the opportunity to create a club in school that deals with mental health, called the Amazing minds Africa/RADA” (Male peer mentor 23 years old).

Peer mentors reported that they made friendships which they did not have before.

“My friendships improved, I become more caring of my friends, these friends were able to help me as well when I had challenges, also I become less judgmental of other people, I learnt to accept people the way they were and this improved my interpersonal relationships” (Female peer mentor 22 years old).

Most peer mentors reported that they gained more self-awareness than they had before.

“I became more knowledgeable on various aspects of my life. I learned more on self-awareness, my mind and how the brain functions, I gained more information on drugs than I ever knew and how to stay away from drugs” (Female peer mentor 19 years).

Another peer mentor had this to say; “As I helped others, it helped me grow so much, I have grown and become more responsible, you cannot do what you are telling people not to do” (male peer mentor 20 years).

Peer mentors organized and participated in various students’ sensitization activities on campus. They reported that these were also helpful to them.

“I got an opportunity to grow my talent, by doing skits and theatre activities in the sensitization campaign against drug abuse, I learnt how to organize teams and to work in a team, I also learnt how to organize meetings” (Female peer mentor 18 years).

Peer mentors also reported that they learnt leadership skills and time management

“I learnt how to manage my time better, my biggest impact in the campus is to spend my time wisely, I also benefitted personally from the program, I learnt problem-solving skills.” (Female peer mentor 22 years).

3. Enhanced communication skills

Peer mentors reported that their communication skills improved by participating in this program.

One peer mentor had this to say: “Through this program, I improved on my communication skills, I gained skills and confidence on how to start a conversation.” (Female peer mentor 22 years).

While another one reported that: “I gained the courage to talk to students and to mentor them, I also gained the courage to interact with other students and to convince mentees that the

intervention was for their good, and to convince people on what is right” (Male peer mentor 23 years).

4. Gained knowledge on students’ problem areas

Peer mentors reported that they learnt a lot about the different issues affecting young people on campus. There were different views on drugs between those who used drugs and those who did not use drugs, one mentee reported that:

“Some mentees who used drugs felt that the peer mentoring was a bother to them, some who used drugs did not want to face the truth about effects of drug use, some mentees who used drugs thought that their problems were not that bad.” (Male peer mentor 23 years).

Peer mentors reported that mentees had diverse problem areas and that some had financial problems, others presented with intimate relationship problems while others reported pregnancy crisis, as well some mentees reported difficulties with their studies. One peer mentor reported that “I realised that the difficult life in campuses pushes more students to use drugs as a coping mechanism, more than peer pressure.” (Male peer mentor 24 years)

5. Use of technology made peer mentoring easier compared to the standard practice

Most of the peer mentors reported that the use of mHealth-based peer mentoring made the process easier to do. One peer mentor said that:

“The portability of the mHealth app was good.” (Female peer mentor 22 years).

Several peer mentors reported that young people and digital tools resonated very well. Another peer mentor said: “Young people liked it that there was no paperwork, furthermore, the structured process made it easier to implement.” (Male peer mentor 23 years).

“It was much helpful and a lot easier to do because of the guidelines, the process was sequential and so easy to follow.” (Male peer mentor 20 years)

6. Challenges with the peer mentoring process

Peer mentors reported that they faced some challenges in their mentoring practice. One of the recurrent challenges was to gain the trust of the mentees.

“Confidentiality was a big concern to the mentees, most mentees did not want it known that they were seeking help, the mentees were still concerned that we may report them to the administration.” (Female peer mentor 22 years)

Another peer mentor reported that: “The use of technology for intervention was still a new idea and some mentees were apprehensive about sharing their information on drug use, some mentees were shy to have their information recorded on a technology device, they were concerned that the information could be hacked. Also, some mentees were concerned about how the information gotten from them would be used.” (Male peer mentor 23 years).

A mentee reported that he encountered some mentees who were not forthright with the information they gave out.

“Some mentees were sarcastic or gave misleading information.” (Male peer mentor 22 years).

Other peer mentors reported that they were faced with some mentees who were in denial and did not believe that they needed any help,

“Peers are not easy to accept guidance, some mentees were apprehensive about opening up too much when they were not too familiar with you, some people were not easy to open up about their issues.” (Female peer mentor 21 years).

Another peer mentor reported that “Some students just flatly refused to participate even when it was clear they were using drugs.” (Male peer mentor 22 years).

Some mentees complained about the length of time a peer mentoring session took, “Others complaints that the peer mentoring took a long time.” (Female peer mentor 18 years).

“Overall most of the mentees were impressed by the peer mentoring process and some mentees wanted to be recruited as peer mentors.” (Male peer mentor 23 years).

Another common challenge was the clash between mentoring activities and classwork.

“Peer mentoring took time and I still had my classwork to attend to.” (Male peer mentor 23 years).

Another peer mentor reported that “It felt like a personal burden when I could not help someone who needed help.” (Female peer mentor 23 years).

While another peer mentor reported that “Some people the mentoring relationship just did not work out, some mentees were non-committal to the process.” (Male peer mentor 23 years)

7. Recommendations by the peer mentors

A majority of the peer mentors suggested that the peer mentoring intervention should continue, “Students still seek me out for mentoring, it should continue and more to more campuses” (Male peer mentor 20 years) another one reported that:

“I desire to continue with this wonderful work, not to leave it” (Female peer mentor 19 years) while yet another was categorical that the program should continue. “This program should continue; it should not end here.” (Male peer mentor 24 years).

The majority of the peer mentors suggested that there was a need for more opportunities for students to interact on campus through organised activities. One peer mentor had this to say: “More sensitization programs on alcohol and drugs prevention are needed on campus.” (Female peer mentor 19 years).

Peer mentors recommended that the mentoring process can be improved to be more appealing to the mentees. “Put more images and vignettes, they are more appealing to young people.” (Male peer mentor 23 years)

Some mentors suggested that it was necessary to build the capacity of mentors to become better. “The need to observe confidentiality and trustworthiness with mentees is key, mentees were requesting for more counselling online also online counselling was more acceptable to

students, the mentees prefer to be counselled from the privacy of their rooms.” (Male peer mentor 23 years).

However, some of the mentees thought that in-person interaction was better than virtual interaction, “I think one on one interactions is better than telephone interactions.” (Female peer mentor 19 years).

The peer mentors gave suggested that on how to improve the mentoring experiences, “The mentor and mentee should work together to agree on a time that is favourable to both of them.” (Female peer mentor 21 years).

Some mentors suggested that the campus administration should support peer mentoring activities by branding them with T-shirts which is important for the visibility of mentors.

CHAPTER FIVE

5.0 DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion, Evaluation and Analysis

5.1.1 Prevalence of alcohol and substance use

The prevalence of alcohol and psychoactive substance use was high among the respondents. One in every four respondents had used a psychoactive substance in their lifetime and this was most likely to have been alcohol (21.9%) or cannabis (8.1%) (Table 2a). Alcohol was also the most currently used psychoactive substance (17%) and most alcohol users drank once or twice a month as opposed to daily use. A similar study done among students at Kenyatta University reported a lifetime prevalence rate of 25.05% which was comparable to the findings of this study (Tumuti et al., 2014). The two universities are located in similar urban environments thus their students face similar experiences which may explain the similarity of the alcohol and substance use prevalence rates.

However, in a study done in Eldoret, Kenya, the lifetime prevalence of alcohol and substance use among college students was reported at 69.7% these findings were dissimilar from the findings of this study (Atwoli et al., 2011). Differences in geographical locations and settings may explain the disparities of findings given that this study and the Eldoret study had respondents of similar age and education. When compared to Nairobi which is the capital city of Kenya, the location of Eldoret is more rural. With the extended coverage of the internet and availability of mobile phones students in rural settings may as well get negative exposure from the Internet and social media platforms.

This is contrary to the common expectations that there are more vulnerabilities and opportunities for alcohol and substance consumption for students in the major cities than their rural counterparts.

Moreover, there has been changes in Kenyan legislation compared to ten years ago when the Eldoret study was done. The Alcoholic Drinks Control Act 2010, revised 2012 has been implemented in Kenya and this has greatly changed the consumption of alcohol and substances in the country (*Alcoholic drinks control act, 2012*).

In Kenya among young adults aged 15-24 years the reported lifetime prevalence of alcohol and substance use was 37.1% (Nacada, 2012). This prevalence rate among the national cohort of young adults in the same age category was higher than the alcohol and substance use prevalence of 25.4% found by this study. Furthermore, there was reportedly a higher current prevalence of alcohol and substance use of 19.8% compared to 17% reported by this study among the young adults (Nacada, 2012). Schooling has been known to be a protective factor for alcohol and substance use because being in school keeps young adults busy which may explain the reduced time available to engage in alcohol and substance abuse activities. This study, however, reported an alcohol use prevalence of 17%, which is higher when compared to the overall national alcohol current use prevalence of 11.7% in Kenya (Nacada, 2012). As well, the national prevalence of current cannabis use was 1.5% while our study findings were 5.2%. While the overall, national prevalence of alcohol and substance was higher than that found by this study, the results this study showed that first-year university students were consuming cannabis at a high rate. The high consumption of cannabis may be attributed to the effects of social media pro-use campaigns spurred on by the ongoing international debate on the legalization of cannabis use which has elicited a lot of excitement and a pro-use attitude among young adults.

Alcohol and substance use by university students is increasingly being considered as an acceptable social norm in universities. Students who have a positive attitude towards alcohol and substance use are therefore more inclined towards its use.

In other studies, across the African continent, the prevalence of alcohol and substance use showed comparable results to those reported by our study. The prevalence of lifetime use of alcohol was reported at 28.9% in Dar es Salaam, Tanzania, in a study done in the year 2009 among the general population (Mbatia et al., 2009) while among university students in Northern Tanzania, the prevalence of alcohol use was reported at 45% among male students as compared to 26% among female students in the same college (Francis et al., 2015). South Africa reported a rising prevalence of alcohol and substance use among those aged 13 and 18 years from 22% at 13 years to a prevalence of lifetime substance use of 66% at 18 years (Ramsoomar et al., 2013).

Nigeria medical students had a reported prevalence of lifetime use of alcohol 39.7%, mild stimulants 46.1% and tobacco 6% (Makanjuola et al., 2014). In the same study, there were comparable results to this study on reported prevalence rates of tobacco and cannabis use. These results show that students in urban settings in Africa experience the same exposure to alcohol and substance consumption exposures and risks. In this study, the prevalence of stimulant use was lower than that found among the medical students in the Nigerian study. Notwithstanding the reported high prevalence of alcohol consumption among Kenyan university students there was a rising trend of use of sedatives (5.2%) hallucinogens (2.2%) and injection drugs (8.1%) reported by this study. This new trend should be studied carefully as university students are more informed than before about the ensuing global opioid crisis and use of synthetic drugs and these may influence their choices in substance use (*Global overview of drug demand and supply*, 2019).

There were some similar as well as dissimilar findings in studies done in European countries. University students in France reported the prevalence of alcohol use 20.1% while the prevalence of tobacco use was 23.2% (Tavolacci et al., 2013). Some member countries of the Association of South-East Asian Nations (ASEAN), conducted prevalence studies among university students in their universities, the results indicated that between 0.2 % of students in Cambodia and 45.7% in Laos consumed an illicit substance at some point in their life (Yi et al., 2017). The prevalence rate is comparable to the results reported from our study, this, therefore, shows that across the continents the rates of alcohol and substance consumption among university students is comparable. Of particular note, however, is that the rate of tobacco use in Europe is higher than the 6% reported by the study. These findings give credence to the global concern of substance use among university students.

The government of Kenya has recently enacted strict tobacco control measures by enforcing the Tobacco control act 2007 revised (2012), which has prohibited tobacco use in all public places among other controls (*Tobacco control act*, 2012). While in France the legislation around tobacco use is more relaxed.

Male university students who were aged 21 years and above showed a high relative risk of lifetime substance use respondents, those studying in the faculty of biological sciences, architecture or computer sciences had a higher prevalence of lifetime alcohol and substance use (Table 3). These high-risk respondents were more likely to be unmarried and residing outside the university accommodation. Young adults aged 18 to 24 years have been shown by studies to have a higher prevalence of substance use behaviour (AM Dhanookdhary, AM Gomez, R Khan, A Lall, D Murray, D Prabhu, A Ragoonath, N Singh, S Tewari, 2010). The prevalence rate of current alcohol and substance use was little across the age categories in this study.

Initiation age into alcohol and substance use behaviour has reduced recently (Nair et al., 2016). The age between 18 to 25 years is crucial for young people as it is the period they pursue their university education, which is key in preparation for their future careers as well as determination of their long-term social-economic outcomes in adulthood.

Male students reported a high prevalence of alcohol and substances to use among the respondents in all categories of substances. This sex difference has been reported from other parts of the world which have indicated that males engage in alcohol and substance use at a higher prevalence than females (Kassa et al., 2014; Silva et al., 2006). Many societies in the world excuse alcohol and substance use among their males more than they do among females. Furthermore, women engage in the consumption of alcohol and substances in private spaces and they may not be identified.

Students who resided in private hostels constituted 48% of the study respondents who had ever used psychoactive substances in their lifetime. Study respondents residing in parents' homes had the second-highest prevalence of alcohol and substance use, university hostels residents reported the least consumption of alcohol and substance (Table 3). Residing in university hostels had been reported in an earlier study to have a high risk for alcohol and substance use (Simons-morton E T, 2016). However, living in off-campus residences posed a high risk of alcohol use as was reported by another study which got similar findings to those of this study (Benz et al., 2017). Student accommodation facilities in Kenya are lenient in the rules that prohibit the use of alcohol and psychoactive substances in their hostels. The private investors are more interested in gaining full room occupancy of their premises which would assure them of continued revenues from the student residents. The resident student, therefore, finds that they have more leeway to engage in partying and merry-making which is the consumption of alcohol and substance use.

This study provides evidence that university management should extend alcohol and substance prevention programs to university students who are housed as private residents. Alcohol and substance use preventive activities currently target mostly the students who are accommodated at university hostels. Unfortunately, this practice leaves out a large and vulnerable group of students who are accommodated in private residences outside the campus premises.

Low-risk consumption of alcohol use was reported by 95% of the alcohol users in this study, there was 5% of respondents that engaged in high-risk alcohol consumption with potential for negative consequences related to their health, social relationships, legal and finances, as per the scores of the AUDIT scale. About 80% of the study respondents who reported alcohol use engaged in episodic drinking, most students socialize with their peers during the weekends and this is the time they are most likely to consume excess alcohol. The practice of ‘binge drinking’ (defined as the consumption of 5 or more alcoholic drinks in a row for males or consumption of 4 or more alcoholic drinks for females) (National Institute on Alcohol Abuse and Alcoholism, 2004) is more prevalent during such times. Binge drinking is associated with a myriad of acute negative consequences including negative effects on developing brain matter (Jones et al., 2018). Regular and daily alcohol use was reported by 5% of the study respondents who were in the first year of their studies, the earlier students begin to use alcohol and substance use, the more likely they are to perform poorly in their academics (Patte et al., 2017) they are as well at the risk of experiencing violence, increased risk of accidents and death (Skidmore et al., 2016). University students who engage in alcohol and substance abuse increase the risk of alcohol use disorders and poor mental wellness which leads to poverty and criminality in the long term (Tahtamouni et al., 2008; White & Hingson, 2013).

These study findings show that the high prevalence of alcohol and substance use among students joining the university is a priority issue for university management that needs to be addressed as students join the university.

The location of residence of university students was found to have an effect on whether or not students engage in alcohol and substance use. Therefore, university management should provide adequate accommodation in the university premises for their students because this minimizes the risk of alcohol and substance use. Alcohol and substance use prevention activities need to focus more on the male university students who were twice as likely as females to engage in alcohol and substance use than females. There is an emerging and worrying trend of the use of sedatives, hallucinogens and injectable substances among university students which should be addressed as a priority. Students are informed about the worldwide problem of opioid crises and the use of synthetic drugs, and these may influence their drug use choices.

5.1.2 Acceptability peer mentoring intervention by peer mentors

This study established that peer mentoring was an acceptable practise among university students peer, mentors. The acceptability of the peer mentoring program was high in both the mHealth-based group (100%) and the standard practice (96%) group (Table 7). Peer mentors in both groups indicated that the program was appropriate and met their expectations. For the successful implementation of an intervention, the approval of the key stakeholders is paramount. Therefore, the evidence provided by these study findings is important in mainstreaming the practice of peer mentoring among students on campus.

Furthermore, 98% of peer mentors from the mHealth-based group and 100% of those from the standard practice group had a positive attitude towards peer mentoring (Table 7). Stakeholders attitude towards an intervention introduced to them is key in determining whether they would use it or not (Proctor et al., 2011). The perceptions of university students towards this important issue should be of interest to the university management, as students are key in shaping opinions among their peers about alcohol and substance use behaviour (McGloin et al., 2014). These results provide evidence that peer mentoring is acceptable among university students are important for university managers while drafting and reviewing their university policies on the prevention of alcohol and substance use. Moreover, the findings of this study show that students can be used as agents of change among their peers and to shape opinions on the prevention of alcohol and substance use while on campus.

These study results are similar to those found in a systemic review and meta-analysis which found that peer-led activities have an impact in preventing substance use among young adults (Macarthur et al., 2016). Furthermore, incorporating peer networks in the intervention delivery has been found to increase the likelihood of success of the intervention (Owen et al., 2018).

The evidence provided by the findings of this study on the high acceptability of mHealth-based peer mentoring among university students is important because the mHealth-based intervention is an innovative approach to deliver alcohol and substance use prevention services among young adults (Aranda-Jan et al., 2014). University students are important players in this fast-growing technological world, thus their acceptability of mHealth-based peer mentoring practice is a win to the field of alcohol and substance use prevention and management.

This study also established that mHealth-based peer-led activities for the prevention of alcohol and psychoactive substance abuse are innovative ways to communicate behaviour change among college students. These study findings are similar to those of a scoping review on the state of mHealth-based interventions in Sub-Saharan Africa (SSA), reported that mHealth interventions have gained widespread recognition as an innovative way of improving health care access especially in low-resource settings and are increasingly being incorporated in behavioural change interventions (Adepoju et al., 2017). These results are also comparable to other studies which showed that peers are instrumental in shaping opinions among members of their social groups thus peer interactions can determine whether peers will start to use alcohol and psychoactive substances or to delay their initiation to substance use behaviour (Cheetham & Lubman, 2017; Hufnagel & Blasiar, 2001; Sánchez et al., 2017).

Overall, these findings indicate that the practice of peer mentoring for alcohol and substance use was acceptable to university students. The findings that university students had a positive attitude towards mHealth-based peer mentoring and felt that they had the resources needed to implement it, is useful and builds a case for the need to train and empower student peers in the prevention of alcohol and substance use on campus. Furthermore, youth-initiated programs have significantly been associated with positive psychosocial outcomes among the youth (van Dam et al., 2020).

This study, therefore, bridges the gap and adds data to the limited evidence available on the use of mHealth-based practices for alcohol and substance use prevention in Sub-Saharan Africa (Adepoju et al., 2017).

5.1.3 The reach of peer mentoring intervention (contacts between peer mentors and mentees)

A total of 540 mentees were reached during the study period. These results showed that the peer mentors in the mHealth-based cohort reached more mentees than those of the standard practice cohort. Four mentees were reached by the peer mentors in the mHealth-based cohort for every one mentored by the standard practice cohort (Table 8). The peer mentors in the mHealth-based group cited the ease of flow and decision making of the intervention as being key to their success while those in the standard practice group cited task execution, data storage and retrieval challenges as the reasons for the lower usage of their tool. The differences in task execution were noted besides both groups of peer mentors showing comparable enthusiasm at the beginning of the study. This thus suggests that the differences were a result of the method used for peer mentoring and that the mHealth-based practice was more efficient when compared to the standard practice.

The differences in the actual performance among the peer mentors in the cohort who used mHealth-based peer mentoring and those who used the standard practice approach are comparable to results from other studies which have indicated that mHealth-based interventions have a wider reach than traditional-based practices and are useful in the prevention of substance use among young adults (Aranda-Jan et al., 2014; Jennifer C. Elliott, Kate B. Careya, 2009). Moreover, the use of mHealth-based intervention for the prevention of alcohol and substance use provides an opportunity for student peers to interact using media which convenient to them.

A systemic review of mHealth-based interventions for public health surveillance in SSA found a paucity of evidence in this area (Brinkel et al., 2014). Fortunately, the findings of this study add value to the available evidence for the use of mHealth-based intervention for behaviour change communication among university students. mHealth-based interventions among young adults have advantages over traditional interventions based on their wide reach and ease of information flow. This may be because young adults are more receptive to new technology and they spend a lot of their time on electronic devices and social media forums like Instagram, WhatsApp, Twitter and Facebook. These media could therefore be used to reach wider end-users at a reduced cost thus making behaviour interventions more accessible (Luxton et al., 2011). At the same time, electronic media can be used in combination with face to face interventions or as stand-alone interventions. It is therefore important to use more mHealth-based approaches to provide interventions to young adults as they have high uptake and interest in the use of technology.

The majority (60%) of the students mentored in both cohorts were males and most of them were in their first second of university education. This is important because prevalence rates from this study showed that males had double odds of alcohol and substance use as compared to females. Efforts to communicate behaviour change in this group of students cannot be overemphasized. Results of this study are comparable to another which found that boys are receptive to peer mentoring and that boys who participated in peer mentoring programs reported fewer behavioural problems (Sánchez et al., 2017). Girls have also been reported to participate in successful peer mentoring relationships (Jenkinson et al., 2012)

Overall, this study builds into the pool of evidence for the benefit of using mHealth-based interventions for large scale screening and early identification of students who abuse alcohol and psychoactive substances in a university setting.

5.1.4 Patterns of alcohol and substance use among the student mentees

Alcohol use was common with lifetime use of 75% and 41% among the student mentees in mHealth-based campus and the standard practice campus respectively. There was a significant difference in the prevalence of alcohol use in the mHealth-based cohort and the standard practice cohort $p < 0.001$. The other most commonly used substances after alcohol were cannabis, tobacco, sedatives and hallucinogens in that order. The mentees in the mHealth-based cohort showed a higher pattern of substance use across all substances. This difference may be explained by the mHealth-based practice being more reliable in screening students who use substances as compared to the standard practice. This difference could also be explained by the fact that the mentors who used the mHealth-based practice screened a larger number of students as compared to those who used the standard practice. The more the number of students screened, the higher the possibility of reaching more who have alcohol and substance use problems.

Furthermore, the trends in substance use showed that the use of cannabis was steadily surpassing tobacco use among the mentees, on both campuses. This may be explained by the inhibitory measures put in place across Kenya to curb the use of tobacco in public places (*Tobacco control act, 2012*), while on the contrary there is an ongoing debate worldwide on the legalization of marijuana use. This marijuana legalization debate has generated interest among college students and most of them are excited by the reported benefits of marijuana use. Furthermore, cannabis is reportedly the most widely used substance worldwide (World Drug Report, 2020).

The use of sedatives, hallucinogens and opioids was also relatively high among the study participants.

This trend should be of concern given that worldwide there is a reported opioid crisis and the use of new psychoactive substances (NSP) especially in Africa (*Global overview of drug demand and supply*, 2019). The results of this study is a wake-up call for the drugs prevention authorities to focus on NSP use prevention as it may be an imminent silent epidemic.

This study found that over 90% of the alcohol users had experienced alcohol-related problems these findings are similar to those reported for college students in the US and Europe (European Monitoring Centre for Drugs, 2019; World Drug Report, 2020).

Furthermore, up to 19 % of the mentees screened positive for harmful alcohol use and 40.1 % needed intervention for their alcohol use based on AUDIT, this was consistent with other reports from Africa and elsewhere in the world (Francis et al., 2015; World Drug Report, 2020). These results also confirm that the use of alcohol and other substances is associated with deleterious consequences to the individuals which include physical and mental health problems thus increasing the global burden of diseases (Degenhardt et al., 2018), as well as poor academic performance which leads to poor social outcomes like lack of employment and poverty in later life (J. Andrews & Clark, 2011).

Overall, while the use of alcohol remains prevalent among university students, there is also a rising use of opioids, sedatives and hallucinogens. Prevention strategies should be heightened for these substance use. University students are well informed about the global trends in substance use because they are technologically savvy, the same media platforms should be used to disseminate counter messages about the negative effects of substance use.

5.1.5 Intervention options taken by peer mentors

Results of this study showed that screening and brief counselling was the most commonly used interventions by the peer mentors as they interacted with their mentees. More than 65% of the mentees received a combination of interventions.

These included combinations of brief counselling, the supply of IEC materials or invitation to support groups and/or referral for further support. Other studies have shown that screening, brief intervention and referral for treatment (SBIRT) are effective interventions in reducing substance use among college students (Terlecki et al., 2015). Most university students tend to downplay the amount of alcohol and substances they consume and at the same time, they are oblivious of the negative consequences of alcohol and substance use. Screening for alcohol and substance use among university students is useful, to identify those who need help for their alcohol and substance consumption and intervene early. Consumption of alcohol and substance use is considered as a rite of passage by the university community, this misconception however delays the opportunity to identify and intervene for university students who may be engaging in harmful alcohol and substance use behaviour. Screening and early identification of substance use among university students should be embraced as a standard practice in alcohol and substance use prevention programs at institutions of higher education.

Research evidence suggests that early screening, brief intervention and referral to treatment have been associated with improvements in treatment outcomes for people with SUD (Babor et al., 2017). A study on peer network counselling among heavy cannabis users adolescents found that adolescents who received the brief intervention were more likely to be abstinent at 6 months post-intervention compared to a control group (Mason et al., 2017).

Brief intervention strategies are cost-effective measures that can be applied in non-clinical setups, thus improving the accessibility to care for youth who engage in alcohol and substance use. Moreover, early screening and brief interventions have been reported to be effective strategies for prevention of alcohol and substance use initiation and continued use for those at risk (Babor et al., 2017; Reho et al., 2016).

Dissemination of information, communication and education (IEC) materials was another method used by peer mentors to reach their mentees with information on the prevention of alcohol and substance use. Young adults are receptive to information presented in graphics and attractive formats. Furthermore, the peer mentors reported that the students welcomed alcohol and substance use prevention IEC materials sent via social media platforms, like WhatsApp and Instagram. These study findings are comparable to reports by stakeholders in substance abuse prevention services who opined that interactive social media platforms like Facebook and Twitter have become important interactive sources of public information, and are powerful tools to help scientists identify prevailing attitudes and myths and convey accurate information to the public about alcohol, tobacco, and other addictive substances (NIDA, 2014). Social media also provides a platform to communicate science-based, health-related messages, and this may also enhance screening, prevention, and treatment of alcohol and substance use and addiction (Miranda & Young, 2014; NIDA, 2014). The global community has steadily recognised the important role played by social media platforms to disseminate scientific messages of public health importance, especially now during this era of the Covid-19 pandemic when face to face interactions are discouraged. Most interactions worldwide have turned digital, thus alcohol and substance use prevention professionals should not be left behind, they should embrace social media to reach these young adults with accurate prevention messages.

This study has provided evidence that peer mentors can be used to provide alcohol and substance use screening and brief counselling for university students.

At the same time, peer mentors are important champions for disseminating factual alcohol and substance use preventive messages via social media platforms. It also gives evidence that the use of social media-based IEC messages dissemination is acceptable among university students. During the ongoing Covid-19 pandemic, the use of social media-based prevention strategies offers tremendous potential to expand the reach of programs on prevention messages on alcohol and substance use among university students.

5.1.6 Exploring the experiences of peer mentors

The peer mentors who participated in this study reported that they benefitted from their participation. Most of them reported that they had gained new information and improved their communication and interpersonal skills. The findings of this study are similar to previous studies, which have reported that peer mentoring interactions benefit both the mentors and the mentees (Rodis et al., 2014; Sánchez et al., 2017). The mentoring relationships build self-confidence in the mentor and build their psychological wellbeing for helping others.

Mentors form a relationship with their mentees, and the success of a peer mentoring relationship has been shown to depend on the strength of the bond between the mentor and the mentee (Mead & MacNeil, 2006; Sánchez et al., 2017). This interaction is beneficial to both the mentor and their mentees, as social relationships are important to the young adults at this stage of their development. Meaningful social interactions bolster the self-esteem as well as self-concept of the partners and help them in social adjustments and feelings of wellbeing.

The mentors reported that they had to live by example because they would not engage in behaviours for which they corrected their mentees.

These study findings are consistent with the social learning theory which states that people learn from their interactions with others in a social context.

As they observe the behaviours of others, people develop similar behaviours (Nabavi, 2016). When peer mentors engage in activities that do not promote the use of alcohol and other substances, the other students who observe these behaviours may assimilate and imitate that behaviour, this is more likely if they observe positive experiences or there are rewards related to the observed behaviour.

Moreover, peer mentors reported that they learned life skills including time management, self-control as well as self-organization. These findings are comparable to the findings of a literature review on mentoring that have found that mentoring confers benefits to the mentor, the mentee and the organization (Garvey & Garrett-Harris, 2005). Participating in the mentoring process makes the mentor gain more self-awareness and get greater satisfaction as well as improved performance in other general aspects of their lives. These new knowledge and skills are likely to improve performance in their academics and college life.

The peer mentors reported that they made useful networks that benefitted them in other ways beyond alcohol and substance use prevention activities. Some peer mentors reported that they got opportunities to attend and make presentations in scientific conferences locally and abroad, while others had gained leadership opportunities in other university forums due to their peer mentoring activities. Peer mentors reported that they had become known in their campuses and thus they interacted well with university management. The findings denote that peer mentoring is also useful to the university management as it facilitates partnerships with the students thus improving communication. The university can use these student peer mentors to introduce strategic changes and innovations as well as problem-solving among the students.

Overall peer mentors reported that their campus life had improved due to their involvement in the peer mentoring activities. They were satisfied with their performance and they expressed willingness to continue with the peer mentoring activities on campus.

Furthermore, the peer mentors reported that the mentees had expressed gratitude and appreciation for the help and guidance they received from the peer mentors. The mentees found the peer mentors more accessible to them than university employed counsellors and it was easier to share their issues as compared to the staff members. The university management should thus make a deliberate effort and make use of student peer mentors as they are a useful resource to influence and improve the communication between the students and the university management.

5.2 Implications of the Study Findings for Public Health Practice

The study findings have implications for screening and early identification strategies for university students who engage in hazardous use of alcohol and psychoactive substances, which will inform strategies for the prevention of alcohol and substance use among university students.

This study provides evidence that the use of mHealth-based peer mentoring is highly acceptable to university students, evidence which universities need for formulation and implementation of mHealth-based peer mentoring policy on alcohol and drugs abuse prevention.

The use of peer mentoring practice was found to be beneficial to the peer mentors, the mentees and the university as well. The university management needs to support peer mentoring practices in the university community.

5.3 Study Limitations

1. This study was done in a single public university as such the findings may not be generalized.
2. The effectiveness of the program was not assessed as the study focused on the implementation outcomes of mHealth-based intervention.
3. The two university campuses involved in this study were different in many aspects including their location and the subjects offered on campus, therefore some of the study results maybe as a result of these differences.

5.4 Conclusions

1. The study findings showed that the prevalence of alcohol and substance use was high among first-year students on the study campuses. One in every four students had used alcohol and substance abuse by the time they join the university. This calls for preventive measures to teach university students about the negative consequences of alcohol and drug use.
2. University students have a positive attitude towards alcohol and substance use. This means they are more inclined to start the use or to continue their substance use while in university. There is, therefore, a need to educate the students on the negative effects of alcohol and substance use.
3. Designing and implementation of mHealth-based interventions is an innovative way to reach students and to pass behaviour change communication to large numbers of university students at their convenience both in the universities and in general society.
4. The practice of peer mentoring was found to be acceptable to both the peer mentors and their mentees. They both reported improvements in their interpersonal relationships as well as general life skills.

5. The mHealth-based peer mentors reached more than 400 university student mentees compared with the 100 students reached by the standard practice cohort, who received screening and brief intervention for alcohol and substance use among other problems. The impressive population reach of the program is attributable in part to the use of student peer mentors and the mHealth-based decision support tool, which aided their work.

6. Use of mHealth-based peer mentoring for alcohol and substance use screening and brief intervention provided an efficient method for program delivery as well as providing feedback about the progress of the alcohol and substance use prevention program.

7. The peer mentoring intervention provided opportunities for leadership development, learning of life skills and social interactions for participants, all of which can be measured in its future application.

8. The Peer mentoring program had benefits for the peer mentors, their student mentees as well as the university management.

5.5 Recommendations

1. We recommend that interventions for the screening and prevention of alcohol and substance use should start early at the entry to university.

2. Universities should increase the available accommodation spaces on campus as this was found to be a protective factor against substance abuse by students.

3. University student peer mentors are an important resource as agents of change. More students should be trained in peer mentoring and deployed by the universities to reach out to their peers.

Peer mentors can be used to prevent alcohol and substance use and promote healthy social and academic behaviour among students at their convenience at the students' halls of residence, lecture rooms and during informal engagements while on campus.

4. Given the high acceptability of mHealth-based peer mentoring intervention, we recommend that the use of mHealth-based interventions for peer mentoring be made the standard practice to reach a large population of students on campus for screening, prevention and early intervention in alcohol and substance use problems.

5. We recommend further study on the effectiveness of mHealth-based peer mentoring practice in screening, brief intervention and referral for alcohol and substance use disorders among university students.

6. The use of social media platforms was identified in this study as useful in disseminating scientifically proven prevention messages to university students, this area needs further studies to determine the feasibility and effectiveness.

7. The dynamics of gender differences in the practice of mentoring is an area of further investigation.

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APPENDICES

APPENDIX 1: INFORMED CONSENT FORM

(Each participant must receive and read this document before the interview)

Introduction

Good day. My name is **Catherine Musyoka**. I am a student at the University of Nairobi. I am doing a study on mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use at the University of Nairobi. You are invited to volunteer to participate in a research study that is being conducted at the University of Nairobi; you should not agree to participate in this study unless you fully understand what is asked of you and are completely happy with all the procedures involved. If you do not understand the information or have any other questions, feel free to ask the interviewer.

Purpose of this interview

The purpose of this study is to collect information so we can understand the prevalence of alcohol and substance use among university students and the issues that lead university students to use alcohol and other substances. The interview will take approximately 30 minutes.

You have been randomly selected to participate in this research.

What procedures are involved?

With your consent, you are being asked to complete a questionnaire. There are no right or wrong answers; we want to know about you, your opinions or your experiences. Your name will not be recorded. The interviewer will be in the same room as you, but will not be able to see what answers you give to the questionnaire. She will only be there to assist you when you need help with the clarification of the questions. We will save the responses that you give to the questionnaire using a unique identification number. This means that your name will not be linked to the answers that you give. Information that is collected from you will be put together with information from 468 other students.

Are there any risks or discomforts from participating in this study?

We will fill the questionnaire in a private and safe place for both you and the researcher. The only potential risk from participating in this study is that you may feel uncomfortable answering some of the questions that may deal with alcohol and substance use issues.

Possible Benefits of this study

There are no direct benefits that you may get from participating in this study. However, the information collected from this study may help improve the lives of university students. Your answers will help us in designing intervention programs suitable for students with alcohol and substance use disorders.

What are your rights as a participant?

Your participation in this study is entirely voluntary. You can refuse to participate or stop at any time without giving any reason. Please remember that you are free to skip over any question you do not want to answer and you are free to stop answering questions at any time.

Confidentiality

All the information that you give in this study will be kept strictly confidential. The consent forms that you will be asked to sign will be securely stored and access will be limited to the research team and study sponsors. The consent forms cannot be linked to the answers you give to the questionnaire. The results of the study will be presented respectfully and no information which could enable anyone to identify you personally will be reported. If you would like to be kept informed of the progress of our project, we will be happy to share any reports or publications we produce with you.

Costs

There is no cost to you for participating in this study.

Compensation

There is no compensation due to you for filling this questionnaire.

Has this study received ethical approval?

Yes, the Ethics Committee granted written approval for this study. You may contact them using the following details should you have any concerns or queries:

KNH-UoN ERC Secretary Contact Telephone number: **2726300 ext. 44102**

Email: uonknh_erc@uonbi.ac.ke, Website: <http://www.erc.uonbi.ac.ke>,

Facebook: <https://www.facebook.com/uonknh.erc>, Twitter: @UONKNH_ERC

Information and contact details of the principal investigator

If you have any questions about the research you may contact, Catherine Musyoka, the Principal investigator, Tel: **0721723514**, **Email: cmusyoka@cartafrica.org** Department of psychiatry, School of Medicine, University of Nairobi

Dr Muthoni Mathai: lead Supervisor, **Tel: 0727329904**, **Email: muthonimathai@gmail.com**

Department of psychiatry, school of medicine, University of Nairobi.

Consent certificate Form

I hereby confirm that the person seeking my informed consent to the participant in this study has given me information to my satisfaction. She/he has explained to me the purpose, procedures involved, risk and benefits and my rights as a participant in the study. I have had enough time to ask questions. I feel that my questions regarding participation in the study have been answered to my satisfaction. I have been told that the information I give to the study will together with other information gathered from other people, be anonymously processed into a research report and scientific publications.

I am aware that it is my right to withdraw my consent in this study without any prejudice. I hereby, freely and voluntarily give my consent to participate in the study.

Participant's name..... (Please print)

Participant's signature.....Date.....

Researcher's name: Catherine Musyoka Tel: 0721723514 Email: cmusyoka@cartafrica.org. Department of Psychiatry, School of Medicine, University of Nairobi

Researcher's signature.....Date.....

Lead Supervisor: Dr Muthoni Mathai Tel: 0727 32 99 04, Email: muthonimathai@gmail.com. Department of Psychiatry, School of Medicine, University of Nairobi

Lead Supervisor's signature.....Date.....

KNH-UoN ERC Secretariat Contact Telephone number 2726300 ext. 44102

Email: uonknh_erc@uonbi.ac.ke, Website: <http://www.erc.uonbi.ac.ke>

Facebook:<https://www.facebook.com/uonknh.erc>, Twitter: @UONKNH_ERC

APPENDIX 2: SOCIO DEMOGRAPHIC QUESTIONNAIRE for PEER MENTORS

Date:

Interviewer Code:

Interviewer Initials:

Peer mentor Biodata

Student/Participant Code

Age:

Gender:

M

F

Religion:

Faculty:

Year of Study: 1

2

3

4

Area of Study:

Mode of Study:

Module 1

Module 11

Marital Status:

Single

Cohabiting

Married

Separated

Widowed

Residence:

On Campus

Private Hostels

At Home

Other

APPENDIX 3: ACCEPTABILITY OF INTERVENTION MEASURE (AIM)

Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), and Feasibility of Intervention Measure (FIM)

GENERAL INSTRUCTIONS: Please check the option which is most applicable to you.

Acceptability of Intervention Measure (AIM)

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
1. mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use meets my approval.	①	②	③	④	⑤
2. mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use is appealing to me.	①	②	③	④	⑤
3. I like mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use.	①	②	③	④	⑤
4. I welcome mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use.	①	②	③	④	⑤

Intervention Appropriateness Measure (IAM) of the mHealth based peer mentoring program

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
5. mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use seems fitting.	①	②	③	④	⑤
6. mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use seems suitable.	①	②	③	④	⑤
7. mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use seems applicable.	①	②	③	④	⑤
8. mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use seems like a good match.	①	②	③	④	⑤

Feasibility of Intervention Measure (FIM) of the mHealth based peer mentoring program

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
9. mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use seems implementable.	①	②	③	④	⑤
10. mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use seems possible.	①	②	③	④	⑤
11. mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use seems doable.	①	②	③	④	⑤
12. mHealth based Student Peer Mentoring Intervention for Reduction of Alcohol and Substance Use seems easy to use.	①	②	③	④	⑤

Perceived Resources of the mHealth based peer mentoring program

	Extremely unlikely	Quite unlikely	Slightly unlikely	Neither	Slightly likely	Quite likely	Extremely likely	Not applicable
13. I have the resources I would need to use the mHealth technology for peer mentoring	①	②	③	④	⑤	⑥	⑦	0
14. There are no barriers to my using the mHealth technology for peer mentoring	①	②	③	④	⑤	⑥	⑦	0
15. I would be able to use the mHealth technology for peer mentoring if I wanted to	①	②	③	④	⑤	⑥	⑦	0
16. I have access to the resources I would need to use the mHealth technology for peer mentoring	①	②	③	④	⑤	⑥	⑦	0

Perceived Usefulness of the mHealth based peer mentoring program

	Extremely unlikely	Quite unlikely	Slightly unlikely	Neither	Slightly likely	Quite likely	Extremely likely	Not applicable
17. Using mHealth technology for peer mentoring can enable mentoring anywhere	①	②	③	④	⑤	⑥	⑦	0
18. Using mHealth technology for peer mentoring can improve my performance	①	②	③	④	⑤	⑥	⑦	0
19. Using the mHealth technology for peer mentoring can make it easier to do mentoring	①	②	③	④	⑤	⑥	⑦	0
20. Using mHealth technology for peer mentoring can increase my productivity	①	②	③	④	⑤	⑥	⑦	0
21. Using mHealth technology for peer mentoring can enhance my effectiveness	①	②	③	④	⑤	⑥	⑦	0
22. I find the mHealth technology for peer mentoring useful in my interventions	①	②	③	④	⑤	⑥	⑦	0

Perceived Ease of Use of the mHealth based peer mentoring program

	Extremely unlikely	Quite unlikely	Slightly unlikely	Neither	Slightly likely	Quite likely	Extremely likely	Not applicable
23. Learning to use the mHealth technology for peer mentoring is easy for me	①	②	③	④	⑤	⑥	⑦	0
24. I find it easy to mentor students using the mHealth technology for peer mentoring	①	②	③	④	⑤	⑥	⑦	0
25. My interaction with the mHealth technology for peer mentoring is clear and understandable	①	②	③	④	⑤	⑥	⑦	0
26. I find the mHealth technology for peer mentoring to be flexible to interact with	①	②	③	④	⑤	⑥	⑦	0
27. It is easy for me to become skilful at using	①	②	③	④	⑤			

the mHealth technology for peer mentoring						⑥	⑦	0
28. I find the mHealth technology for peer mentoring easy to use	①	②	③	④	⑤	⑥	⑦	0

Attitude Toward Using the mHealth Based Peer Mentoring Program

	Extremely unlikely	Quite unlikely	Slightly unlikely	Neither	Slightly likely	Quite likely	Extremely likely	Not applicable
29. MHealth technology for peer mentoring is beneficial.	①	②	③	④	⑤	⑥	⑦	0
30. The mHealth technology for peer mentoring is positive.	①	②	③	④	⑤	⑥	⑦	0
31. If I wanted to I would find it easy to use the mHealth technology for peer mentoring	①	②	③	④	⑤	⑥	⑦	0

Behavioural Intention to Use the mHealth Based Peer Mentoring Program

	Extremely unlikely	Quite unlikely	Slightly unlikely	Neither	Slightly likely	Quite likely	Extremely likely	Not applicable
32. Assuming I have access to the mHealth technology for peer mentoring, I intend to use it.	①	②	③	④	⑤	⑥	⑦	0
33. Given that I have access to mHealth technology for peer mentoring, I plan to use it.	①	②	③	④	⑤	⑥	⑦	0
34. It is worth it to use the mHealth technology for peer mentoring	①	②	③	④	⑤	⑥	⑦	0
35. I will frequently use mHealth technology for peer mentoring in the future.	①	②	③	④	⑤	⑥	⑦	0

Actual Use Behaviour of the mHealth Based Peer Mentoring Program

	Not applicable	Less than once	Once a week	Several times a week	About once a day	Several times
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		a w e e k				each day
36. On average, I log in on the mHealth technology for peer mentoring	0	②	③	④	⑤	⑥

Actual Use Behaviour of the mHealth Based Peer Mentoring Program

	Not applicable	L e s s t h a n 1 5 m i n u t e s	B e t w e e n 1 5 a n d 3 0 m i n u t e s	B e t w e e n 3 1 a n d 4 5 m i n u t e s	B e t w e e n 4 6 a n d 6 0 m i n u t e s	M o r e t h a n 6 0 m i n u t e s
37. On average, the length of time I spent every time I log on to the mHealth technology for peer mentoring is	0	②	③	④	⑤	⑥

APPENDIX 4: FOCUS GROUP DISCUSSION

Focus Group: Peer Mentor Demographic Details Questionnaire

Please answer the following questions in the spaces provided, circle or tick the most appropriate options.

Student/Participant Code

Age:

Gender: M F

Religion:

Faculty:

Year of Study: 1 2 3 4

Area of Study:

Mode of Study: Module 1 Module 11

Marital Status: Single Cohabiting Married Separated Widowed

Residence: On Campus Private Hostels At Home Other

Thank you for taking the time to complete this questionnaire

Focus Group: Discussion Guide

Facilitator's welcome, introduction, and instructions to participants

Welcome and thank you for volunteering to take part in this focus group. You have been asked to participate as your point of view is important. I realize you are busy and I appreciate your time.

Introduction: This focus group discussion is designed to document your experiences in using the mHealth based peer mentoring technology. The focus group discussion will take no more than two hours.

May I tape the discussion to facilitate its recollection? (if yes, switch on the recorder)

Anonymity: Despite being taped; I would like to assure you that the discussion will be anonymous. The tapes will be kept safely in a locked facility until they are transcribed word for word, then they will be destroyed. The transcribed notes of the focus group will contain no information that would allow individual subjects to be linked to specific statements. You should try to answer and comment as accurately and truthfully as possible. I and the other focus group participants would appreciate it if you would refrain from discussing the comments of other group members outside the focus group. If there are any questions or discussions that you do not wish to answer or participate in, you do not have to do so; however please try to answer and be as involved as possible.

Ground rules

- Let one person speak at a time. There may be a temptation to jump in when someone is talking but please wait until they have finished.
- There are no right or wrong answers
- You do not have to speak in any particular order
- When you do have something to say, please do so. There are many of you in the group and I must obtain the views of each of you
- You do not have to agree with the views of other people in the group
- Does anyone have any questions? (answers).

- OK, let's begin

Warm-up

- First, I'd like everyone to introduce themselves. Can you tell us your name?

Introductory question

I am just going to give you a couple of minutes to think about your experience of using mHealth based technology for peer mentoring activities. Is anyone happy to share his or her experience?

Guiding questions

- How acceptable was the use of mHealth technology for peer mentoring by you and by other students? (What did students think/say/do?)
- What was the reaction towards the use of mHealth technology for peer mentoring? Was it a positive/negative reaction? If negative, how could it be rectified?
- Do you think mHealth based technology is likely to improve the practice of student peer mentoring? If not, why not?
- What are the barriers to using mHealth based peer mentoring technology? What are the enablers?
- How many students did you mentor using the mHealth technology for peer mentoring?
- How would the mHealth based peer mentoring technology be made easier to use/implement?

Concluding question

- Of all the things we've discussed today, what would you say are the most important issues you would like to express about this mHealth based peer mentoring technology?

Conclusion

- Thank you for participating. This has been a very successful discussion
- Your opinions will be a valuable asset to the study
- We hope you have found the discussion interesting
- If there is anything you are unhappy with or wish to complain about, please contact the PI or speak to me later

- I would like to remind you that any comments featured in this report will be anonymous
- Before you leave, please hand in your completed personal details questionnaire

Please, write your report based on the results of the focus group. Please remember to maintain the confidentiality of the participating individuals by not disclosing their names.

APPENDIX 5: INFORMED CONSENT FORM (KAP SURVEY)

(Each participant must receive and read this document before the interview)

Introduction

Good day. My name is **Catherine Musyoka**. I am a student at the University of Nairobi. I am doing a study to understand the Knowledge, Attitudes, and Practice of 1st year University of Nairobi Students towards Alcohol and drug use.

You are invited to volunteer to participate in a research study that is being conducted at the University of Nairobi; you should not agree to participate in this study unless you fully understand what is asked of you and are completely happy with all the procedures involved. If you do not understand the information or have any other questions, feel free to ask the interviewer.

Purpose of this interview

The purpose of this study is to collect information so we can understand the prevalence of alcohol and substance use among university students and the issues that lead university students to use alcohol and other substances. The interview will take approximately 30 minutes.

You have been randomly selected to participate in this research.

What procedures are involved?

With your consent, you are being asked to complete a questionnaire. There are no right or wrong answers; we want to know about you, your opinions or your experiences. Your name will not be recorded. The interviewer will be in the same room as you, but will not be able to see what answers you give to the questionnaire. She will only be there to assist you when you need help with the clarification of the questions. We will save the responses that you give to the questionnaire using a unique identification number. This means that your name will not be linked to the answers that you give. Information that is collected from you will be put together with information from 384 other students.

Are there any risks or discomforts from participating in this study?

We will fill the questionnaire in a private and safe place for both you and the researcher. The only potential risk from participating in this study is that you may feel uncomfortable answering some of the questions that may deal with alcohol and substance use issues.

Possible Benefits of this study

There are no direct benefits that you may get from participating in this study. However, the information collected from this study may help improve the lives of university students. Your answers will help us in designing intervention programs suitable for students with alcohol and substance use disorders.

What are your rights as a participant?

Your participation in this study is entirely voluntary. You can refuse to participate or stop at any time without giving any reason. Please remember that you are free to skip over any question you do not want to answer and you are free to stop answering questions at any time.

Confidentiality

All the information that you give in this study will be kept strictly confidential. The consent forms that you will be asked to sign will be securely stored and access will be limited to the research team and study sponsors. The consent forms cannot be linked to the answers you give to the questionnaire. The results of the study will be presented respectfully and no information which could enable anyone to identify you personally will be reported. If you would like to be kept informed of the progress of our project, we will be happy to share any reports or publications we produce with you.

Costs

There is no cost to you for participating in this study.

Compensation

There is no compensation due to you for filling this questionnaire.

Has this study received ethical approval?

Yes, the Ethics Committee granted written approval for this study. You may contact them using the following details should you have any concerns or queries:

KNH-UoN ERC Secretary Contact Telephone number **2726300 ext. 44102**

Email: uonknh_erc@uonbi.ac.ke, **Website:** <http://www.erc.uonbi.ac.ke>
Facebook: <https://www.facebook.com/uonknh.erc>, **Twitter:** @UONKNH_ERC

Information and contact person

If you have any questions about the research you may contact

Catherine Musyoka: The Principal Investigator Tel: **0721723514**

Email: cmusyoka@cartafrica.org. Department of Psychiatry, School of Medicine, University of Nairobi

Lead Supervisor, Dr Muthoni Mathai Tel: 0727 32 99 04,

Email: muthonimathai@gmail.com. Department of Psychiatry, School of Medicine, University of Nairobi

Consent certificate Form

I hereby confirm that the person seeking my informed consent to participate in this study has given me information to my satisfaction. She/he has explained to me the purpose, procedures involved, risk and benefits and my rights as a participant in the study. I have had enough time to ask questions. I feel that my questions regarding participation in the study have been answered to my satisfaction. I have been told that the information I give to the study will together with other information gathered from other people, be anonymously processed into a research report and scientific publications.

I am aware that it is my right to withdraw my consent in this study without any prejudice. I hereby, freely and voluntarily give my consent to participate in the study.

Participant's name..... (Please print)

Participant's signature.....Date.....

Researcher's name: Catherine Musyoka Tel: 0721723514 Email: cmusyoka@cartafrica.org. Department of Psychiatry, School of Medicine, University of Nairobi

Researcher's signature.....Date.....

Lead Supervisor: Dr Muthoni Mathai Tel: 0727 32 99 04, Email: muthonimathai@gmail.com. Department of Psychiatry, School of Medicine, University of Nairobi

Lead Supervisor's signature.....Date.....

KNH-UoN ERC Secretariat Contact Telephone number 2726300 ext. 44102

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Facebook: <https://www.facebook.com/uonknh.erc>, Twitter: @UONKNH_ERC

APPENDIX 6 : SOCIO DEMOGRAPHIC QUESTIONNAIRE (KAP)

Date:

Interviewer Code:

Interviewer Initials:

Student Biodata

Student/Participant Code

Age:

Gender:

M

F

Religion:

Faculty:

Year of Study: 1

2

3

4

Area of Study:

Mode of Study:

Module 1

Module 11

Marital Status:

Single

Cohabiting

Married

Separated

Widowed

Residence:

On Campus

Private Hostels

At Home

Other

APPENDIX 7 : WHO ASSIST V3 QUESTIONNAIRE

WHO ASSIST V3 QUESTIONNAIRE							
Qn. 1	In your life, which of the following substances have you ever used? (<i>NON-MEDICAL USE ONLY</i>)	No	Yes				
		0	3				
a.	Tobacco products (cigarettes, chewing tobacco, cigars, etc.)						
b.	Alcoholic beverages (beer, wine, spirits, etc.)						
c.	Cannabis (marijuana, pot, grass, hash, etc.) 0 3						
d.	Cocaine (coke, crack, etc.)						
e.	Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)						
f.	Inhalants (nitrous, glue, petrol, paint thinner, etc.)						
g.	Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)						
h.	Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)						
i.	Opioids (heroin, morphine, methadone, codeine, etc.)						
j.	Other - specify:						
Probe if all answers are negative: "Not even when you were in school?" If "No" to all items, stop the interview. If "Yes" to any of these items, ask Question 2 for each substance ever used.							
Qn. 2	<i>In the past three months, how often have you used the substances you mentioned (FIRST DRUG, SECOND DRUG, ETC)?</i>	Never	Once or twice	Monthly	Weekly	Daily or Almost Daily	
		0	2	3	4	6	
a.	Tobacco products (cigarettes, chewing tobacco, cigars, etc.)						
b.	Alcoholic beverages (beer, wine, spirits, etc.)						
c.	Cannabis (marijuana, pot, grass, hash, etc.)						
d.	Cocaine (coke, crack, etc.)						
e.	Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)						
f.	Inhalants (nitrous, glue, petrol, paint thinner, etc.)						
g.	Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)						

h.	Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)						
i.	Opioids (heroin, morphine, methadone, codeine, etc.)						
j.	Other - specify:						
	<i>If "Never" to all items in Question 2, skip to Question 6.</i>	<i>If any substances in Question 2 were used in the previous three months, continue with Questions 3, 4 & 5 for each substance used.</i>					
Qn. 3	<i>During the past three months, how often have you had a strong desire or urge to use (FIRST DRUG, SECOND DRUG, ETC)?</i>	Never 0	Once or twice 2	Monthly 3	Weekly 4	Daily or Almost Daily 6	
	Tobacco products (cigarettes, chewing tobacco, cigars, etc.)						
	b. Alcoholic beverages (beer, wine, spirits, etc.)						
	c. Cannabis (marijuana, pot, grass, hash, etc.)						
	d. Cocaine (coke, crack, etc.)						
	e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)						
	f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)						
	g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)						
	h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)						
	i. Opioids (heroin, morphine, methadone, codeine, etc.)						
	j. Other - specify:						
Qn. 4	<i>During the past three months, how often has your use of (FIRST DRUG, SECOND DRUG, ETC) led to health, social, legal or financial problems?</i>	Never 0	Once or twice 4	Monthly 5	Weekly 6	Daily or Almost Daily 7	
a.	Tobacco products (cigarettes, chewing tobacco, cigars, etc.)						
b.	Alcoholic beverages (beer, wine, spirits, etc.)						
c.	Cannabis (marijuana, pot, grass, hash, etc.)						
d.	Cocaine (coke, crack, etc.)						
e.	Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)						
f.	Inhalants (nitrous, glue, petrol, paint thinner, etc.)						

g.	Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)						
h.	Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)						
i.	Opioids (heroin, morphine, methadone, codeine, etc.)						
j.	Other - specify:						
Qn. 5	<i>During the past three months, how often have you failed to do what was normally expected of you because of your use of (FIRST DRUG, SECOND DRUG, ETC)?</i>	Never 0	Once or twice 5	Monthly 6	Weekly 7	Daily or Almost Daily 8	
a.	Tobacco products	Leave this option blank		Leave this option blank		leave blank	
b.	Alcoholic beverages (beer, wine, spirits, etc.)						
c.	Cannabis (marijuana, pot, grass, hash, etc.)						
d.	Cocaine (coke, crack, etc.)						
e.	Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)						
f.	Inhalants (nitrous, glue, petrol, paint thinner, etc.)						
g.	Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)						
h.	Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)						
i.	Opioids (heroin, morphine, methadone, codeine, etc.)						
j.	Other - specify:						
	<i>Ask Questions 6 & 7 for all substances ever used (i.e. those endorsed in Question 1)</i>						
Qn. 6	<i>Has a friend or relative or anyone else ever expressed concern about your use of (FIRST DRUG, SECOND DRUG, ETC.)?</i>	No, Never 0	Yes, in the past 3 months 6	Yes, but not in the past 3 months 3			
a.	Tobacco products (cigarettes, chewing tobacco, cigars, etc.)						
b.	Alcoholic beverages (beer, wine, spirits, etc.)						
c.	Cannabis (marijuana, pot, grass, hash, etc.)						
d.	Cocaine (coke, crack, etc.)						
e.	Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)						

f.	Inhalants (nitrous, glue, petrol, paint thinner, etc.)						
g.	Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)						
h.	Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)						
i.	Opioids (heroin, morphine, methadone, codeine, etc.)						
j.	Other – specify:						
Qn. 7	<i>Have you ever tried and failed to control, cut down or stop using (FIRST DRUG, SECOND DRUG, ETC.)?</i>	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months			
		0	6	3			
a.	Tobacco products (cigarettes, chewing tobacco, cigars, etc.)						
b.	Alcoholic beverages (beer, wine, spirits, etc.)						
c.	Cannabis (marijuana, pot, grass, hash, etc.)						
d.	Cocaine (coke, crack, etc.)						
e.	Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)						
f.	Inhalants (nitrous, glue, petrol, paint thinner, etc.)						
g.	Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)						
h.	Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)						
i.	Opioids (heroin, morphine, methadone, codeine, etc.)						
j.	Other – specify:						
Qn. 8	<i>Have you ever used any drug by injection? (NON-MEDICAL USE ONLY)</i>	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months			
		0	2	1			
Place an X in one box that best describes your answer to each question. Your answers will remain confidential so please be honest. AUDIT 10							
	Questions	0	1	2	3	4	
1.	How often do you have a drink containing alcohol?	Never	Monthly	2-4 times	2-3 times	4 or more	

2.	How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more	
3.	How often do you have six more drinks on one occasion?	Never	Less than Monthly	Less than weekly	Weekly	Daily or almost daily	
4.	How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than Monthly	Monthly	Weekly	Daily or almost daily	
5.	How often during the last year have you failed to do what was normally expected of you because of drinking?	Never	Less than Monthly	Monthly	Weekly	Daily or almost daily	
6.	How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than Monthly	Monthly	Weekly	Daily or almost daily	
7.	How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than Monthly	Monthly	Weekly	Daily	
8.	How often during the last year have you been unable to remember what happened the night before because of your drinking?	Never	Less than Monthly	Monthly	Weekly	Daily	
9.	Have you or someone else been injured because of your drinking?	No		Yes, but not in the last year		Yes, during the last year	
10	Has a relative, friend, doctor, other health care worker been concerned about your drinking last year or suggested you cut down?	No		Yes, but not in the last year		Yes, during the last year	

Scale for the measurement of attitudes towards alcohol

11	Drinking helps one feel at ease within a group	Strongly Agree	Agree	Disagree	Strongly Disagree		
12	Drinking eases relationships with the opposite sex	Strongly Agree	Agree	Disagree	Strongly Disagree		
13	Drinking makes one more talkative	Strongly Agree	Agree	Disagree	Strongly Disagree		
14	Drinking makes one feel more self-confident	Strongly Agree	Agree	Disagree	Strongly Disagree		
15	Drinking alcohol helps one to Overcome their shyness	Strongly Agree	Agree	Disagree	Strongly Disagree		
16	One drinks alcohol when they need to Relax	Strongly Agree	Agree	Disagree	Strongly Disagree		
17	Drinking alcohol deals with	Strongly Agree	Agree	Disagree	Strongly Disagree		

	feelings of despair						
18	People sometimes drink when they are angry	Strongly Agree	Agree	Disagree	Strongly Disagree		
19	One can drink alcohol to escape from everyday problems	Strongly Agree	Agree	Disagree	Strongly Disagree		
20	People drink when they are sad	Strongly Agree	Agree	Disagree	Strongly Disagree		
21	When alcohol is free it's 'stupid not to take advantage'	Strongly Agree	Agree	Disagree	Strongly Disagree		
22	People consume less when they have to pay for every drink	Strongly Agree	Agree	Disagree	Strongly Disagree		
23	Never turn down a free drink	Strongly Agree	Agree	Disagree	Strongly Disagree		
24	When offered a free drink accept even if you don't feel like It	Strongly Agree	Agree	Disagree	Strongly Disagree		
25	When offered several free drinks in one evening anyone drinks more than usual	Strongly Agree	Agree	Disagree	Strongly Disagree		

ROSENBERG SELF-ESTEEM SCALE

Below is a list of statements dealing with your general feelings about yourself.

Please indicate how strongly you agree or disagree with each statement.

26	On the whole, I am satisfied with myself.	Strongly Agree	Agree	Disagree	Strongly Disagree		
27	At times I think I am no good at all.	Strongly Agree	Agree	Disagree	Strongly Disagree		
28	I feel that I have a number of good qualities.	Strongly Agree	Agree	Disagree	Strongly Disagree		
29	I am able to do things as well as most other people.	Strongly Agree	Agree	Disagree	Strongly Disagree		
30	I feel I do not have much to be proud of.	Strongly Agree	Agree	Disagree	Strongly Disagree		
31	I certainly feel useless at times.	Strongly Agree	Agree	Disagree	Strongly Disagree		
32	I feel that I'm a person of worth, at least on an equal plane with others.	Strongly Agree	Agree	Disagree	Strongly Disagree		
33	I wish I could have more respect for myself.	Strongly Agree	Agree	Disagree	Strongly Disagree		
34	All in all, I am inclined to feel that I am a failure.	Strongly Agree	Agree	Disagree	Strongly Disagree		
35	I take a positive attitude toward myself.	Strongly Agree	Agree	Disagree	Strongly Disagree		

APPENDIX 8: ETHICAL APPROVAL



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KENYATTA NATIONAL HOSPITAL
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Tel: 726300-9
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Telegrams: MEDSUP, Nairobi

Ref. No.KNH/ERC/R/134

4th August 2020

Catherine Mawia Musyoka
Reg No.H80/51727/2017
Dept.of Psychiatry
School of Medicine
College of Health Sciences
University of Nairobi

Dear Catherine

Re: Approval of Annual Renewal – Prevention of Alcohol and Substance Abuse: mHealth Technology based Peer Mentoring among University of Nairobi students (P98/02/2018)

Refer to your communication received on 15th July 2020.

This is to acknowledge receipt of the study progress report and hereby grant annual extension of approval for ethical research protocol P98/02/2018.

The approval dates are 30th May 2020 -29th May 2021.

This approval is subject to compliance with the following requirements:

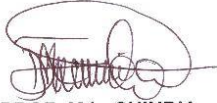
- a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- b) All changes (amendments, deviations, violations etc.) are submitted for review and approval by KNH- UoN ERC before implementation.
- c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH- UoN ERC within 72 hours of notification.
- d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
- e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- f) Clearance for export of biological specimens must be obtained from KNH- UoN-Ethics & Research Committee for each batch of shipment.
- g) Submission of an *executive summary* report within 90 days upon completion of the study
This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

Protect to discover

Kindly in future, adhere to renewal lines as per clause(e) above.

For more details consult the KNH- UoN ERC website <http://www.erc.uonbi.ac.ke>

Yours sincerely,








PROF. M.L. CHINDIA
SECRETARY, KNH-UON ERC

c.c. The Principal, College of Health Sciences, UoN
The Director CS, KNH
The Chairperson, KNH-UoN ERC

Protect to discover

APPENDIX 9: NACOSTI APPROVAL

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 990379	Date of Issue: 06/August/2020
RESEARCH LICENSE	
	
This is to Certify that Ms., CATHERINE MAWIA MUSYOKA of University of Nairobi, has been licensed to conduct research in Nairobi on the topic: PREVENTION OF ALCOHOL AND SUBSTANCE ABUSE: mHEALTH BASED PEER MENTORING AMONG STUDENTS AT THE UNIVERSITY OF NAIROBI for the period ending : 06/August/2021.	
License No: NACOSTI/P/20/5582	
990379 Applicant Identification Number	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
	Verification QR Code 
NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.	

APPENDIX 10: PERMISSION TO COLLECT DATA



UNIVERSITY OF NAIROBI
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September 18, 2018

Ms. Catherine M. Musyoka
University Health Services
University of Nairobi

PERMISSION TO CONDUCT RESEARCH AT THE UNIVERSITY OF NAIROBI

I refer to your request to conduct research at the University of Nairobi for your PhD in Clinical Psychology project on '*Prevention of Substance Abuse: mHealth Technology Based Peer Mentoring among University of Nairobi Students*'.

I write to inform you that your request has been approved. You are required to share the findings of your study with the University of Nairobi by depositing a copy of your research findings/thesis with the University of Nairobi Librarian on completion of your study.

Yours Sincerely,

PROF. MADARA OGOT
AG. DEPUTY VICE-CHANCELLOR
(RESEARCH, PRODUCTION AND EXTENSION)

RAO/..

Scanned with CamScanner

APPENDIX 11: CURRICULUM FOR PEER MENTORING

PEER COUNSELLING CURRICULUM

1.0 INTRODUCTION

At any age, when someone is in distress, naturally he/she often turns first to a peer for help. A growing body of evidence suggests that with the right sort of training and support, it is possible to create systems that facilitate this natural process and which build on the potential for helping which is already there. It is with this in mind that the University counsellors have designed a course to harness the capacity which peers have to help one another resolve the problems and difficulties they encounter in life, especially on the campus, in an attempt to live well-adjusted, wholesome lives. The curriculum focuses on what it means to be a person of character and how the character is essential for a healthy life and fulfilling relationships. The lessons spotlight the pandemic of unprecedented sexually transmitted disease, HIV and AIDS and emotional perspectives. The focus is also on life skills that will enable students to stand up against peer pressure, saying no with fitness and developing practical ways to stand strong under temptation.

2.0 OVERALL GOAL OF THE COURSE

To empower peer counsellors with skills, knowledge and attitudes for holistic growth.

3.0 OBJECTIVES

By the end of the course, the students should be able to:

- 3.1 Demonstrate the appropriate techniques and skills in actual one on one counselling.
- 3.2 Gain appropriate self-awareness in their personal lives and practice of counselling.
- 3.3 Demonstrate knowledge of selected psychological issues in counselling.
- 3.4 Demonstrate knowledge in alcohol and substance abuse counselling

3.5 Prepare them to cope with problems facing them in the modern world.

3.6 Prepare students to become responsible parents and citizens.

4.0 TARGET GROUP

The course targets the entire student body. Following the criteria outlined below, a representative student sample will be selected for training in peer counselling, and the group's clientele will encompass the entire student population.

5.0 ELIGIBILITY

By being registered students of the university (having signed the nominal roll), all students qualify to join the training programme. However, since the students cannot all be trained at the same time, a representative sample shall be selected from the interested students, taking into consideration:

- Gender
- Academic Performance – Maintain Average B
- International/Foreign students
- Motivation
- Level of commitment
- Role model

COURSE DURATION AND STRUCTURE

In total, the Peer Counselling Course will take 120 hours. It will be structured in the following manner.

6.0 Lectures: There will be 2 hrs lectures from the 2nd week of the semester to the 14th week. The time of the lectures will be dependent on the students' academic timetables and will preferably take place on weekends (20 hrs) at the end of the semester. This will make a total of 46 hours of lecture.

6.1 Personal Therapy: Each student will be expected to go through one hour sessions of individual Counselling with a professional counsellor preferably from the campus. This will make a total of 13 hours

6.2 Group Supervision: Participants will be meeting in groups of 6 with a supervisor (Student Counselors) every fortnight for case referring. This will make a total of 20 hours.

6.3 Journal Writing: Each student will be expected to spend at least an hour a week in journal writing, recording the personal experiences relating to the training. These will be shared in a class as the need arises. NB: Hours spent in Journal writing are not part of the 120 hrs.

6.4 Practical: These will involve role-playing sessions of the counsellor and student and where possible videotapes will be used. Consequently, each student will be expected to spend at least 2 hours a week in actual counselling or helping peers for the entire period of the training. This will make a total of 26 hours.

6.5 Project Writing: Each student will be expected to select a counselling area of individual interest and write a paper on it demonstrating the use of counselling skills learnt. This will account for 15 hours. The peer mentoring curriculum takes a total of 120 hours.

7.0 AWARD OF CERTIFICATE

A student who has completed all the above requirements will be awarded a peer counselling certificate at the end of the course.

COURSE DESCRIPTION

The following topics will be covered in the course:

8.0 SELF-AWARENESS

This will allow the trainees to have their self-concept. It will enable them to build on their self-esteem. This will also enable students to understand their strengths and weakness to accept themselves and thus be in a position to relate to others. (4 hours)

8.1 INTRODUCTION TO COUNSELING THEORIES

This is an overview of the major theories, which include the Psychoanalytic theory, Behavioral theory, person-centred theory, Humanistic theory, Cognitive theory Egan's Model, and Gestalt theory of counselling. This will serve to introduce students to counselling and begin to establish a framework of practising counselling (4 hours).

8.2 PERSONAL GROWTH/BEHAVIOUR CHANGE

This is an exploration of how people can change undesirable or dysfunctional behaviour to desirable and effective behaviour. This begins with the learners themselves (4 hours)

8.3 COMMUNICATION

This is the examination of the art of communication as a major component of counselling and more importantly, an exploration of how to be better communicators. This will look at the following areas different types of communication, barriers to communication, negative communication and negotiation skills (4 hours)

8.4 BASIC COUNSELLING SKILLS

The student will be equipped with basic skills that include the core conditions of counselling, listening skills, responding skills and referrals (4 hours)

175 | 206 Use of mHealth-based peer mentoring to prevent alcohol and substance abuse among students.

8.5 CONTEMPORARY ISSUES

This is an examination of emerging issues in counselling which includes HIV/AIDS, substance abuse, and human sexuality. Relationships, financial management, counselling in substance use disorder, time management

8.5.1 Alcohol and Substance Abuse Prevention

Provide an overview of the risks and protective factors for substance use among college students; myths and realities about drugs; and peer support and referrals for those at risk of SUDs and those manifesting problem behaviour related to SUDs.

Objectives of the training: • Discuss the problem of ADA from the perspective of youth and youth leaders • Create awareness on the negative effects of ADA among students in tertiary institutions • Empower peer educators and student leaders to support comrades with ADA challenges • Identify strategies for tertiary institutions interventions. This training targets peer educators and student leaders in universities and colleges. (12hours)

8.6 PROFESSIONAL ETHICS

This involves an examination of standards that guide the practice of counselling so that it remains ethical in the clients' best interest. Particularly ethical issues that are specific to peer counselling and the dilemmas ensuing will be examined. (4 hours)

8.7 CAREER AND JOB SEARCH SKILLS

Students will be equipped with helpful skills to help determine their careers and how to search for jobs. Besides, they will be equipped on how to help others. The following areas will be covered character traits and attributes for job profile, work values and how to write a winning CV and cover letter. Attending an interview and how to do a job survey (4 hours)

8.8 LIFE SKILLS

This general examination of basic counselling skills will enable the students and those eventually to be counselled how to survive successfully in the world with its challenges and live a more wholesome and well-adjusted life.

8.9 RESOURCE CENTER

Finally, peer counsellors should generate ideas to enhance peer counselling.

The following is a list of proposed outreach programmes:

- Organize programmes entailing visits to both primary and secondary schools.
- Visit youth programmes in neighbouring communities.
- Outreach to special needs groups such as the elderly, hospitalized and disabled.
- Recruitment of new peer counsellors.
- Reaching out to problematic students especially in the case of drug and alcohol abuse and sexual abuse.
- Monitoring of academically weak students.

PROFESSIONAL ETHICS

Introduction

Sooner or later, every person involved in helping others faces and deal with the issues implied by questions such as:

Can I be a friend to my counselees?

Can I be a counsellor to my friends?

Ethical dilemmas relating to counselling relationships will always emerge. For this reason, professional counsellors usually adhere to counselling ethics which provide the primary rationale for the contents of codes of ethics of helping professionals.

The five principles are:

1. Respect for autonomy

This is an individual's right to self-determination (ie to determine who they are):

To think as they wish even if others disagree

To act freely even if others don't like their choices

Autonomy must be respected with two restrictions:

- The rights of an individual end where others begin. A person has the freedom to act as long as others' rights are not being violated.
- It assumes that individuals are capable of understanding the implications and consequences of the choices that they make.

Counsellors need to avoid acting paternalistically i.e. in the role of a parent who "knows better" than the client.

The client's values often conflict with the values of the counsellor. The principle of autonomy means that counsellors cannot ethically impose their values on clients or use their influence to get clients to "see things the right way" though we know that clients' beliefs and values can and do change during counselling.

2. Beneficence (doing good)

This is at the core of the profession, the justification for the existence of the counselling profession. As such, counsellors have deeper ethical responsibilities than ordinary confidants or friends. Counsellors must do all they can to help. Leaving clients at the end of counselling in the same place as they began is inconsistent with the counsellor's role.

3. Non-maleficence (avoiding harm)

This is the responsibility not to make the client worse by intention, reckless action or incompetence. Precisely because counsellors profess to be helping persons, they have a duty not to make the client worse if the outcome is unavoidable. Counselling can be a powerful tool used to a client's disadvantage. Thus the burden of the counsellor to assess client problems accurately, choose counselling strategies accurately and monitor the impact of counselling on each client is great. This principle emphasizes that a counsellor must not exceed his competence but rather practice within his competence – dealing with a client's problem with which one is skilled unless under a supervisor. When evaluating whether a course of action is ethical, the counsellor must also ask whether a course of action is ethical, the counsellor must also ask whether the client is at risk or in harm. If he is, an alternative course of action should be sought.

4. Justice or Fairness

This demands that persons be treated equally. Judgment about counselling goals and strategies should be based on the individual characteristics of the client not on discriminatory attitudes towards groups. Stereotyping and bias are unethical because they are unjust, regardless of whether the discriminatory attitudes are conscious or not.

Counsellors should not allow themselves to be put into the service of discrimination but should display respectful and unbiased attitudes when counselling clients who are different in culture, background, religion, lifestyle or gender.

5. Fidelity (promise-keeping)

Promoting trust is the counsellor's main goal in initial counselling sessions because self-disclosure and trust are critical to the success of the counselling process. This trust empowers a counsellor to be able to do good or harm the client. When counselling begins, counsellors implicitly promise not to divulge what a client tells them unless there is some overwhelming reason that is ultimately in the client's or society's best interest.

Confidentiality is limited in some circumstances, and it is important for the counsellor to explain these limits to the client before self-disclosure begins.

Loyalty, (another way of understanding fidelity) demands that counsellors be loyal to clients, employers and the profession. This involves not abandoning a client amid counselling. Though it may be necessary to terminate counselling prematurely, the principle of fidelity requires the counsellor to provide for appropriate referral for that client to be faithful to the initial promise to provide help.

When trying to decide on the ethics of action, the counsellor should ask:

'Is this choice in keeping with the promises I made, either implied or explicit?'

ETHICAL ISSUES IN PEER COUNSELING

1. The boundaries of the counselling relationship

The boundaries of the counselling relationship can be defined along two dimensions: Firstly, some boundaries relate to the nature of the peer counsellor's role and the counselling situation.

Secondly, there are boundaries concerning the type of difficulty with which peer counsellors can work.

Problems can arise when the boundaries of the counselling relationship are unclear, and any institution planning to introduce a peer counselling service needs to be explicit about the purpose of the service and consequently the limitations of the peer counselling role and client-counsellor relationship.

i) The role of the peer counsellor

The role of the peer counsellor is that of an active listener and facilitator.

Peer counsellors are not psychotherapists. Not advice-givers.

ii) The client-counsellor relationship

The counsellor should be able to recognize and accept that their relationship with their client is restricted to the time they spend in their counselling situation.

It is not appropriate for them to be overly supportive of the client or to refer to their counselling relationship at other times. This can be difficult if the peer counsellor and the client are in the same class or year group. If, as is often the case, the problem brought to the counselling situation

relates to a relationship difficulty to another peer, the counsellor must also be able to carry on their day to day involvement in school life without being accepted by their knowledge.

Disagreement outside the counselling situations can create dilemmas for the peer counsellor which should be addressed through supervision and support.

Peer counsellors are not advocates for their clients. If peer counsellors are tempted to become advocates for their clients, they overstep the boundaries of client-counsellor relationships.

As a peer intervention, befriending can provide a powerful framework for support.

iii) The nature of problems explored within peer counselling situations

Whilst young people are competent to deal with a wide range of difficulties, there are some aspects of fellow students' lives, which should be referred to professional counsellors because of legal implications.

Each institution should think carefully about the range of issues the peer counselling service should work with and which should be referred.

The training and supervision offered to peer counsellors should work with and which should be referred. The training and supervision offered to peer counsellors may then need to address each of these issues to ensure that the peer counsellors have a broader understanding of the nature of the problems.

Training and supervision is also an opportunity for the peer counsellors to become sensitive to the moral conflicts which their clients are experiencing. They need to be helped to become aware of the values and judgments which they bring to the counselling situation. This does not mean that the peer counsellor should learn to be morally neutral, but on the contrary, the peer counsellor needs to learn to be in tune with their values and to be in the process of understanding what they are and where they come from.

2. The nature of Confidentiality

Professional ethics of counselling prescribe limits to confidentiality. If abuse or significant harm is suspected the counsellor must pass on their concerns on the appropriate service.

So where does this leave the peer counsellor? The peer counsellor can agree that he/she will not discuss the content of the counselling session or the identity of the client with anybody outside the service, but they should regularly discuss with the counsellor in charge.

How far can peer, counsellors, however well-meaning be trusted to address sensitively and responsibly the complexities of the problems which their peers are likely to be experiencing?

Even if they recognize the difficulties, do they have the skill to clarify them and discuss them with their clients?

What happens if they encounter pathological behaviour? It is important for the counsellor responsible to provide regular opportunities for peer counsellors to share concerns with their groups and to offer supervision for issues as they arise.

Confidentiality extends to record-keeping and note-taking. Recording the nature of the case, the dates of visits and the outcome helps the counsellor to keep a record for reference. Not recording the name of the client protects his/her identity, but in some circumstances, it may be important to know the person who used the service. This is particularly so if a serious event occurs which involves the student who used the service or if it is necessary to know what action had been taken on the person. Whatever information is recorded, must be carefully stored carefully and securely but be accessible to the client if requested.

(This also applies to any information stored on a computer). Files containing information about clients should not be carried around the institution in a counsellor's bag, stored in a locker or taken home.

3. The importance of support and supervision

Professional counsellors continually reflect upon their practice and establish opportunities of some kind to discuss their work with another counsellor on regular basis. These opportunities are usually called supervision. This kind of support is not only helpful for exploring difficult cases but can provide feedback for the counsellor about the effectiveness of their counselling style and the impact of their work upon themselves and their client. The word “supervision” can have different meanings for different people.

It means to “overlook”. Outside the counselling setting, supervision is often defined as having one’s work checked for accuracy. It, therefore, becomes a situation where one’s work is judged.

In counselling, the term is used to describe a situation whereby a person reflects

collaboratively upon different aspects of their counselling to continue the learning process.

Within a college or school setting, you may wish to use the word “support”, “reflection” or “case discussion” with the peer counsellors. Essentially, supervision in peer counselling situations is meant to give the peer counsellors opportunity to discuss difficult cases and issues ensuing from their counselling, with the counsellor supervision

It is essential for the maintenance and continued development of a quality peer counselling service.

OVERVIEW OF MAJOR COUNSELLING THEORIES

1. PSYCHOANALYTIC THEORY

The psychoanalytic theory of counselling was originally developed by Sigmund Freud (1856-1939) from his experience as a therapist. It is the oldest and most influential of all counselling theories. Freud saw people as biological beings driven by the desire for personal pleasure or gratification. If allowed to grow and develop without controls, people would serve their selfish pleasures without regard for the rights of others or the accomplishment of useful work.

The belief that people relegate material they cannot tolerate to the unconscious, using defence mechanisms such as repression is fundamental to the psychoanalytic counselling process. Since crucial issues have been pushed out of awareness without being resolved, unmet needs to keep intruding into the fabric of life.

The process of counselling, then, encourages the client to dislodge unconscious material and resolve the conflict contained therein. The client is encouraged to talk as freely as possible about troublesome situations and this talking often leads to recall of related thoughts that were repressed. This is known as 'free association' in which the client is asked to suspend control over what he or she says and just let speech flow, regardless of how disconnected or bizarre the material seems. Sometimes dreams are analyzed for clues to the unconscious. Freud's form of psychoanalysis was a thorough, long-term helping process that places heavy emphasis on the client's historical psychosexual development. The goal was for the client to gain insight into all aspects of his or her personality. Regardless of the method of disclosure- free association, or dream analysis- the counsellor seeks to understand the client's motives and interpret to the client his or her thoughts, feelings and behaviours. The counsellor relies on his or her knowledge of psychodynamics to lead the client to new insights

2. BEHAVIOURAL COUNSELLING

Behaviourism is a point of view about psychology that is concerned with observable measurable, operational behaviour. Any conceptualization about what goes on inside the person, such as inner feelings and ideas are considered unnecessary, redundant, and of no great value for understanding human beings. The best known, most controversial, and most influential behaviourist is B.F. Skinner whose specific theory is known as "operant reinforcement"

The fundamental assumption of behaviourism is that all behaviour is learned and therefore can be changed by implementing strategies to produce learning. The purpose of behavioural counselling is to change ineffective and self-defeating behaviour, and only measurable behaviour change is regarded as evidence of successful counselling.

Behavioural counselling places great emphasis on a clear definition of goals. Goals are stated in terms of behaviour change so that observation will provide evidence that can be measured. Because the goal is a specific behaviour, the counsellor and client can assess the extent of accomplishment. Counselling strategies are based on the principle of learning. Operant conditioning is one of the most common procedures used in behavioural counselling.

The procedure, which can be used to eliminate undesirable behaviours or to develop positive behaviours, uses reinforcement techniques.

Desensitization training, based on the principles of classical conditioning is used to help clients reduce or eliminate irrational fears or phobias.

Modelling is yet another process whereby the client is taught new behaviours. A model (the counsellor, a peer in group counselling) demonstrates effective behaviour in a situation with which the client has difficulty, and the client observes the model's behaviour.

3. HUMANISTIC THEORY

The humanistic theory is known as the 3rd force in psychology. It is a broad term referring to approaches trying to address the question of what it means to become fully human. A specialized branch of humanism is the person-centred therapy developed by Carl Rogers (1942). In person-centred counselling, human beings are seen as possessing goodness and the desire to become “fully functional”, that is to live as effectively as possible. According to

Rodgers, if a person is permitted to develop freely, he/she shall flourish and become a positive, achieving individual.

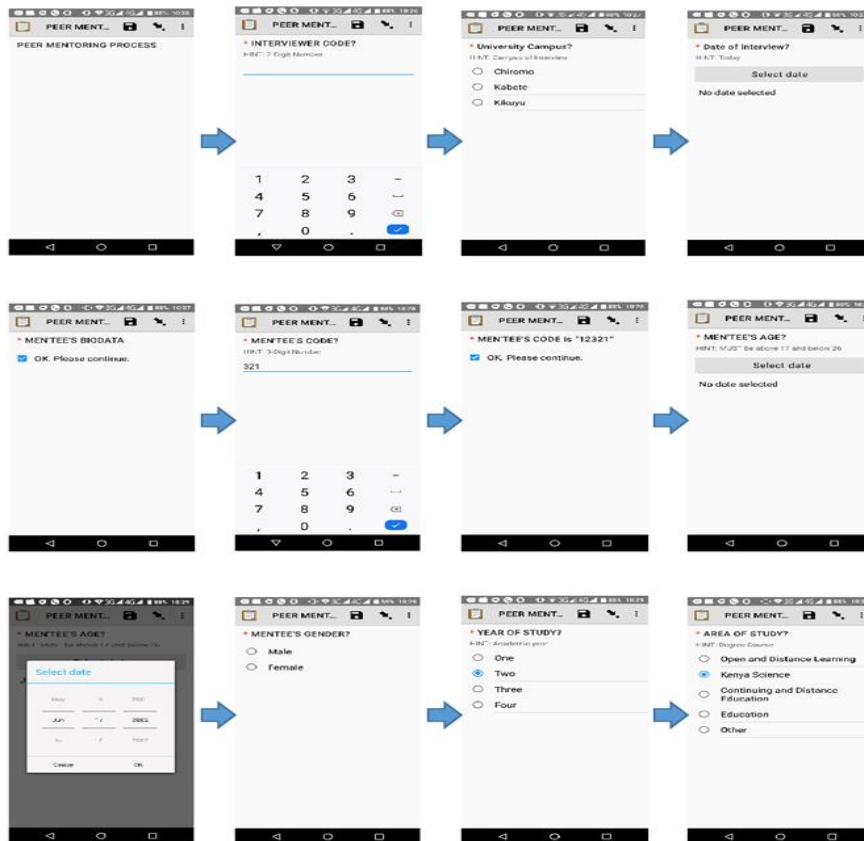
With the view that humans were positive and self-actualizing by nature, Rogers conceived the counsellors' role as providing conditions that would permit self-discovery and that would encourage the client's natural tendency toward personal growth. If the counsellor is accepting of each client as a person, relates empathically to the client's reality, and behaves genuinely, the client will be free to discover and express the positive core of his or her

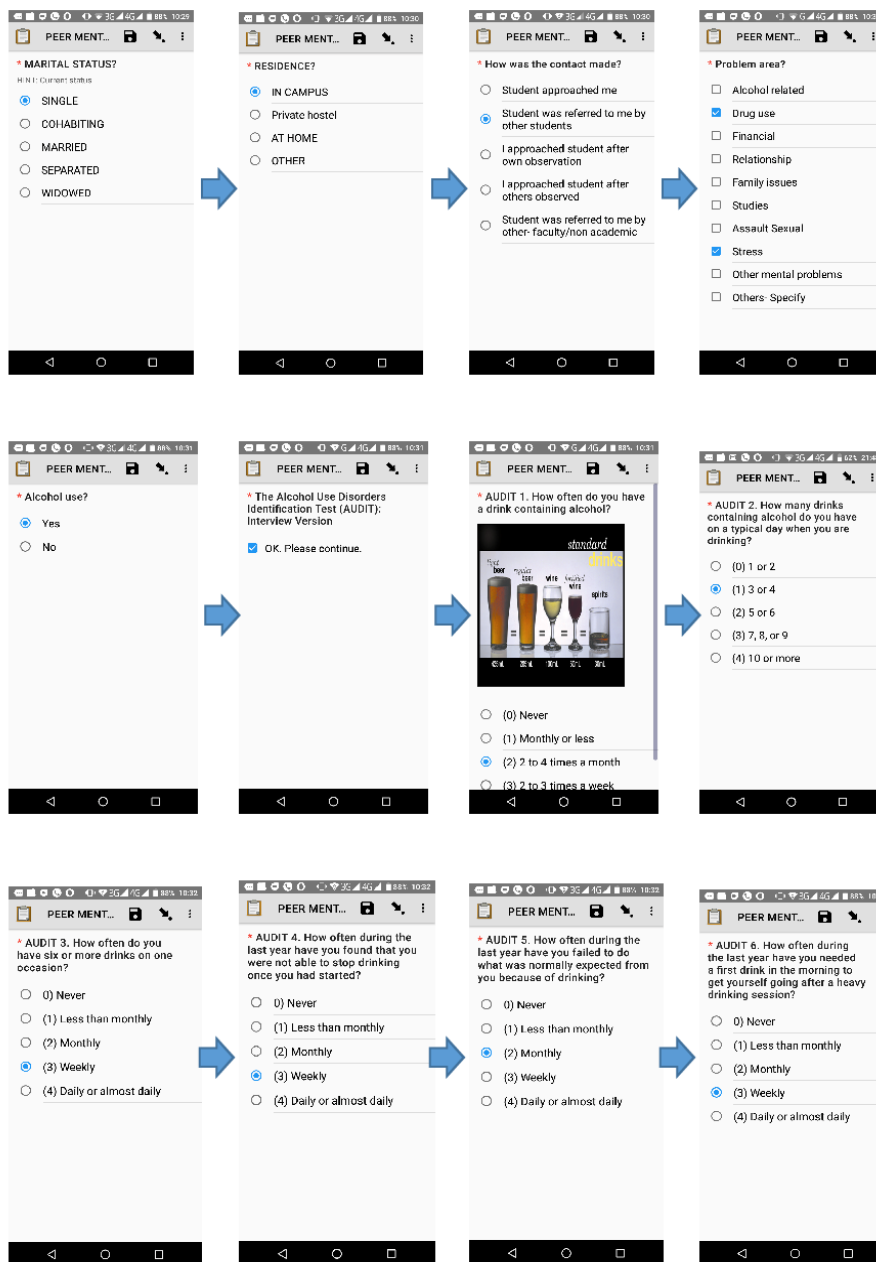
being. It has been said that in person-centred counselling, helpers learn how to be counsellors rather than how to do counselling. Because clients are seen as having the potential to solve their problems, counsellors are not perceived as having expert knowledge to share with clients

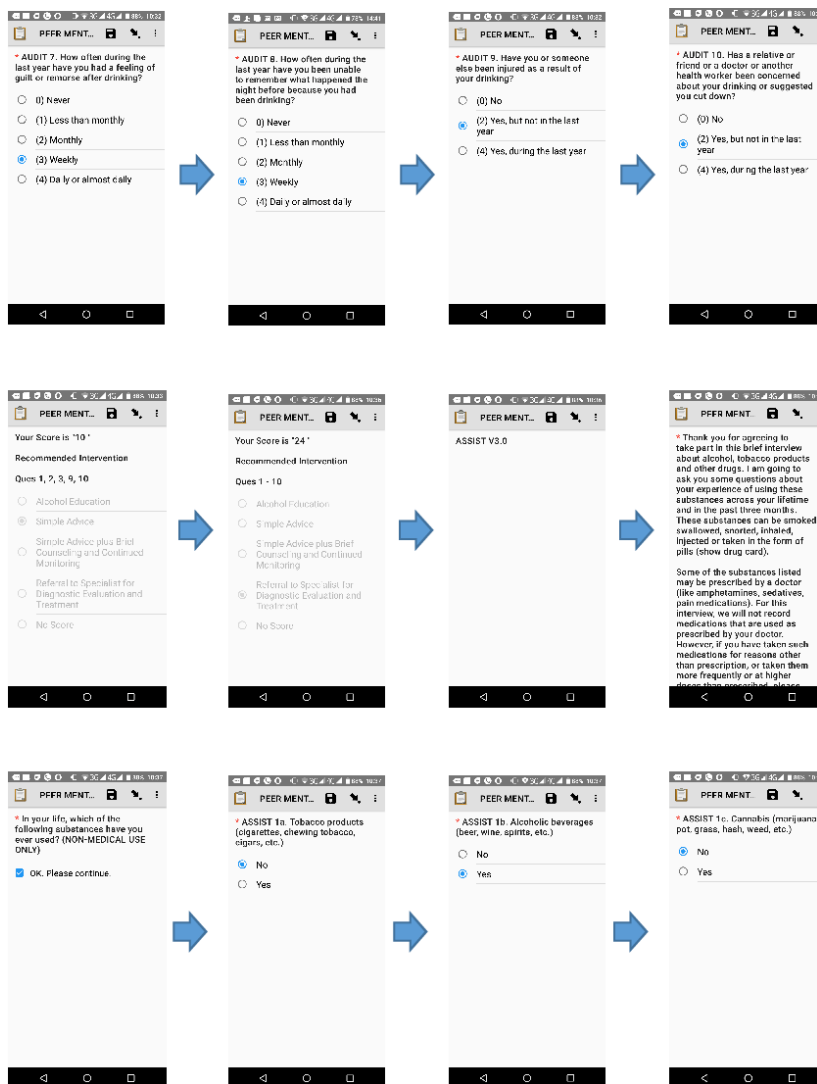
There is little focus on specific action planning except as initiated by the client. It is assumed that as the client becomes free to actualize his or her potential through the exploration process, behaviour change will occur naturally and without prompting from the counsellor.

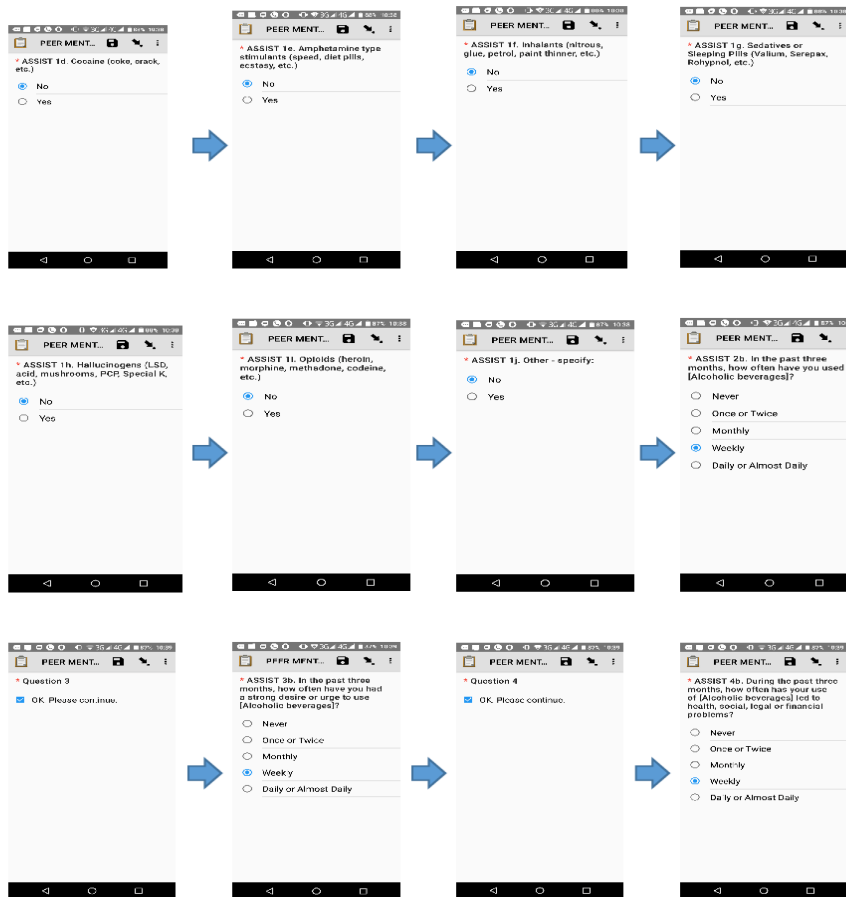
APPENDIX 12: MHEALTH-BASED CLINICAL DECISIONAL SUPPORT TOOL PROTOTYPE

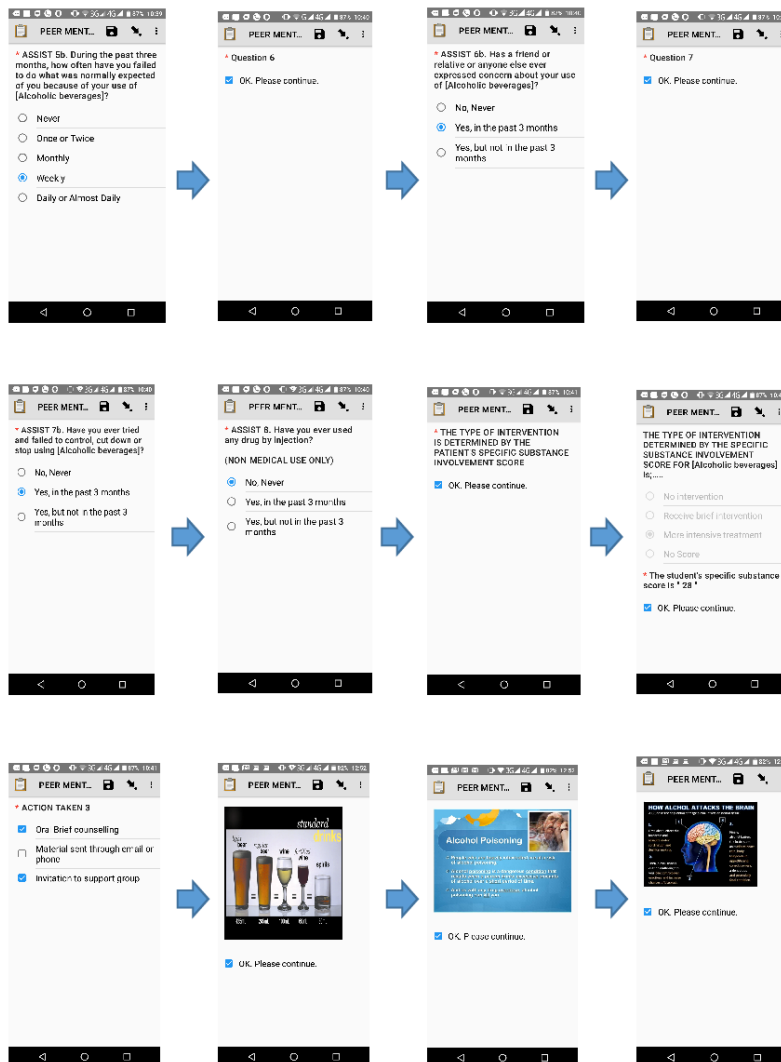
MHealth Peer Mentoring App

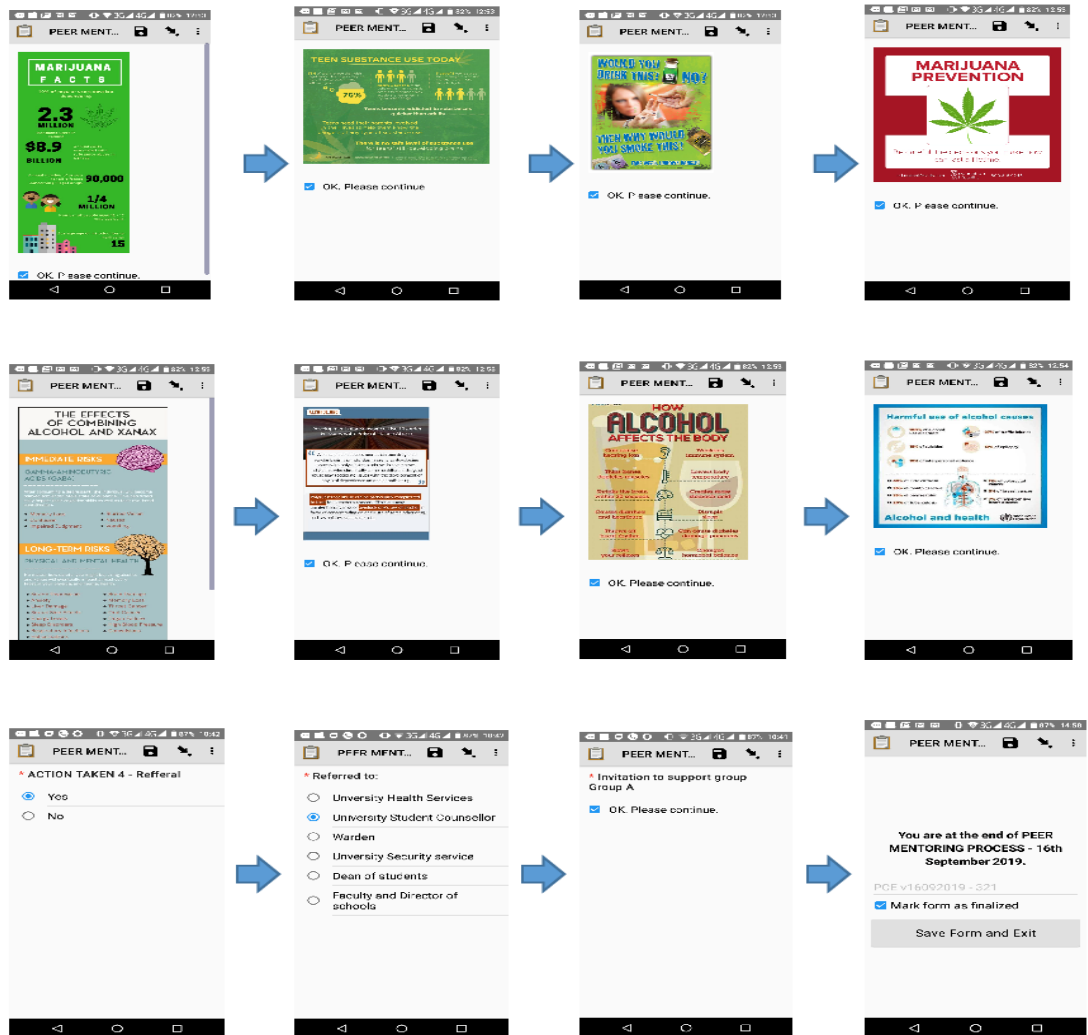












APPENDIX 13: PEER MENTORING GUIDE FOR KIKUYU CAMPUS

FORM 1 - Peer Mentoring Guide and Practice Form (KIKUYU CAMPUS)

INSTRUCTIONS

As part of your peer mentoring activities, you will interact with fellow students and help them to stop their involvement in substance use, by taking any one or more of the below-listed actions.

Please use the following table to guide you. Provide all the details step by step.

1.	Peer Mentor Code	Mentee Code					
	Mentee Biodata						
	Age	Sex	Male	Marital Status	Married	Residence:	Campus
			Female		Single		Private Hostels
							Home
	Mentee Religion			Practising	YES	NO	
	Mentee source of Finances			Amount spent per month			
	Program Course						
	Date of Contact with the mentee						
	Session Number						
	Time of session	Start					
		End					
2.	Contact Information (How was contact made)						Tick
	Student approached me						
	The student was referred to me by other students						
	I approached the student after my observation						
	I approached the student after others observed						
	The student was referred to me by other- faculty/non-academic						
	<i>Note: Only one may apply</i>						
3	Presenting Problem (One or more may apply)						
a	Alcohol use only (If 3b YES- GO to AUDIT TOOL then continue to 4)						
b	Alcohol and other drugs (If YES- GO to ASSIST TOOL, then continue to 4)						
c	Other drugs (Specify..... (If YES- GO to ASSIST TOOL, then continue to 4)						
	If either 3a, 3b or 3 c YES- continue to 4 below only after assessment USING THE TOOLS PROVIDED						
d	Problems with Boy/Girlfriend						

e	Problems with parents/siblings	
f	Problems of pregnancy and parenthood	
g	Financial problems	
h	Academic problems	
i	Sexual Assault	
j	Stress	
k	Other problems (specify).....	
	If 3a,3b and 3c (NO) Continue below to 4	
4.	Action Taken on other presenting problem NOT ADA related (tick as appropriate)	
	Brief counselling (Refer section 11)	
	Give information on how to deal with the presenting problem	
	Referred to (specify): -	
	Any Other (Specify)	
	Nothing (No action was taken)	
5.	Assessment scores	
a	ASSIST SCORES	
b	AUDIT SCORES	
6.	Action Taken after assessment on ADA Note: One or more may options may apply	
	Oral Brief counselling (Go to section 10)	
	Give Information Education & Communication (IEC) Materials	
	Material sent through email or phone	
	Invitation to ADA support group	
	Referral where to.....	
b.	(If Referred YES (Tick as appropriate) Note: Only one may apply)	
	University Health Services	
	University Student Counsellor	
	Hall warden	
	University Security service	
	Dean of students	
	Departmental Head	
7.	Have you followed up on the students (If YES what method below did you use?)	
	Telephone call	
	SMS	
	WhatsApp	

	Group meeting		
	Individual face to face		
	<i>Note: Only one more may apply</i>		
8.	Student Peer Progress (How do you evaluate the progress)		
	The student has been responding to SMS		
	The student has been seeking me out for face for face		
	The student has been attending sessions I have organised		
	The student has been participating in support groups		
	<i>Note: One or more may apply</i>		
9.	What is your opinion?		
	In your opinion would you say the FOLLOW UP is satisfactory	YES	NO
	In your opinion would you say you have had a good rapport with the students	YES	NO
	In your assessment is the student showing some behavioural change?	YES	NO

10. BRIEF INTERVENTION FOR SUBSTANCE USE COUNSELLING

1. Interpret and give feedback on scores on an assessment of substance involvement, **AUDIT OR ASSIST SCORES. (Refer to ASSIST and AUDIT SCORES are provided separately)**
2. Encourage the mentee to talk about their substance use behaviour, when and how it started
3. Explore reasons why mentee uses substances and the perceived benefits
4. Invite the mentee to consider quitting the use of substances
5. Explain to the mentee the benefits of quitting substance use
6. Introduce to the mentee a quit strategy, including change of friends, change of recreations places and activities
7. Suggest to the mentee alternative activities to substance use:
 - Time management
 - Games
 - Recreational activities
 - Clubs
8. Provide reading materials, brochures, posters, fliers
9. Set a follow-up date **(Save the return date on a calendar, Mobile phone reminder or Alarm)**

APPENDIX 14: RECORD OF PEER MENTORS' ACTIVITIES AWARENESS AT CAMPUS

Fill this form every time you organise an activity individually or as part of a group and indicate the estimated numbers involved

DATE:

THEME:

VENUE

TYPE OF MEETING		Attendance (Numbers)
Formal	Organised by Self: Sensitization/Psychoeducation meeting	
	Organised by Others: Student activity related to Alcohol and Drug abuse	
Informal Activities	Spontaneous student discussions on topic.....	
Other	Specify	
DATE	TOPICS OF DISCUSSION	PRESENTER
	Registration and Climate Setting	
	Introduction, Set Objective for the meeting	
	What are psychoactive substances	
	Types of Substances of Abuse and classification	
	How substances are trafficked and used	
	Effects of substance use, personal, social, institutional	
	Way Forward	

APPENDIX 15: AUTHOR'S 1st PUBLICATION



Journal of Substance Use




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mHealth-based peer mentoring for prevention of alcohol and substance abuse among first year university students: protocol for quasi-experimental intervention

Catherine Mawia Musyoka, Anne Mbwayo, Dennis M. Donovan & Muthoni Mathai

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mHealth-based peer mentoring for prevention of alcohol and substance abuse among first year university students: protocol for quasi-experimental intervention

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^aDepartment of Psychiatry, College of Health Sciences, University of Nairobi, Nairobi, Kenya; ^bDepartment of Psychiatry & Behavioural Sciences and Alcohol & Drug Abuse Institute, University of Washington School of Medicine, Seattle, WA, USA

ABSTRACT

Objective: The use of psychoactive substances increases university students' general morbidity and mortality. Universities run programs to prevent psychoactive substance use since they are associated with the risk of poor academic outcomes. The University of Nairobi (UoN) trains peer mentors who counsel students to prevent substance use. There is, however, inadequate feedback and no evaluation of the effectiveness of this method. This study will pilot mobile health (mHealth) based peer mentoring, evaluate and provide feedback about implementation. It will be based in two campuses of UoN, Nairobi, Kenya.

Methods: Three phases study. In the first phase, a baseline survey determines students' knowledge about, attitudes toward, and prevalence of substance use at baseline and the end of the intervention phase. Second phase, mHealth based intervention using a quasi-experimental design. Participants 100 mentors (50 intervention and 50 control groups). Intervention group using mHealth screens for substance use, provide structured brief intervention and treatment referral. A comparative control group, using a paper-based guide will deliver the same program. Phase three, mentors during focused group discussions will share their experiences.

Results: Data will be collected on implementation, acceptability and substance use patterns. Data analysis using descriptive, inferential statistics and thematic content analysis for qualitative data.

Conclusions: The study will provide evidence on the implementation and acceptability of mHealth among university students. This will inform national and regional substance use prevention policy and practice.

Abbreviations: ASSIST: Assessment of Smoking and Substance Involvement Test; AUDIT: Alcohol Use Disorder Identification Tool; KAP: Knowledge, Attitude, and Prevalence; mHealth: Mobile Health; RDSDQ: Researcher Designed Socio-Demographic Questionnaire; UNODC: United Nations Office on Drugs and Crime; USA: United States of America; WHO: World Health Organization

ARTICLE HISTORY

Received 5 March 2020

Revised 23 April 2020

Accepted 29 April 2020

KEYWORDS

Alcohol and substance use; decisional support; mHealth; peer mentors; university students

Background

Alcohol and substance use is a global public health concern, more so among young people between the ages of 18 to 25 years, which is reportedly the peak of substance use (World Drug Report, U., 2018). This is an age of important milestones in a person's life for various reasons:

(i) At this age adolescents transition to adulthood; bringing new challenges because, though there is an increase in body size, the adolescents' brains are yet to develop to adult maturity (Skidmore et al., 2016). (ii) Psychologically, adolescents are prone to thrill-seeking; they need to socialize, feel good, and engage in risky behaviors which lead to negative consequences (Dayan et al., 2010). (iii) This period marks the transition from high school to a college education; this exciting venture comes along with new pressures and uncertainties, which may be coupled with personal and social maladjustments (Ross et al., 2008; World Drug Report, U., 2018). All these are risk factors which make alcohol and substance use to be high among University students, making it a global public health problem.

Globally, there is reportedly increased use of psychoactive substances, in Africa and Asia there is a soaring use of tramadol while

North America is facing an opioid crisis (World Drug Report, U., 2018). In the United States of America (USA) substance use among those aged 18 to 25 years is in the increase (McCance-Katz, 2018), with females having increased use of cannabis, prescription drugs, and alcohol (Organization of American States, C 2019). In Europe an estimated 19.1 million young adults used substances in 2018 (European Drug Report, 2019); males used substances twice as much as females, while cannabis was the most used substance (European Drug Report, 2019; United Nations Office on Drugs and Crime [UNODC], 2018).

The prevalence of substance use among undergraduate students in one African university was reported at 27.5% with alcohol, codeine, tramadol and tobacco being the most used substances (Johnson et al., 2017). In Kenya, the prevalence of substance use among University students ranges from 25% to 67.9% (Atwoli et al., 2011). Alcohol, cannabis, and tobacco are the most used substances (Tumuti et al., 2014).

Prevention of substance use among university students is key to avert immediate and long term deleterious consequences. Universities go to great lengths to prevent and treat alcohol

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RESEARCH ARTICLE

Alcohol and substance use among first-year students at the University of Nairobi, Kenya: Prevalence and patterns

Catherine Mawia Musyoka^{1*}, Anne Mbwayo¹, Dennis Donovan², Muthoni Mathai¹

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Abstract

Objective

Increase in alcohol and substance use among college students is a global public health concern. It is associated with the risk of alcohol and substance use disorders to the individual concerned and public health problems to their family and society. Among students there is also the risk of poor academic performance, taking longer to complete their studies or dropping out of university.

This study determined the prevalence and patterns of alcohol and substance use of students at the entry to the university.

Method

A total of 406 (50.7% male) students were interviewed using the Assessment of Smoking and Substance Involvement Test (ASSIST) and the Alcohol Use Disorder Identification Tool (AUDIT). Bivariate logistic regression analyses were used to examine associations between substance use and students' socio-demographic characteristics. Multivariate logistic regression analysis was conducted to examine the predictors of the lifetime and current alcohol and substance use.

Results

Lifetime and current alcohol and substance use prevalence were 103 (25%) and 83 (20%) respectively. Currently frequently used substances were alcohol 69 (22%), cannabis 33 (8%) and tobacco 28 (7%). Poly-substance use was reported by 48 (13%) respondents, the main combinations being cannabis, tobacco, and alcohol. Students living in private hostels were four times more likely to be current substance users compared with those living on campus (OR = 4.7, 95% CI: 2.0, 10.9).

Conclusion

A quarter of the study respondents consumed alcohol and/or substances at the entry to university pushing the case for early intervention strategies to delay initiation of alcohol and substance use and to reduce the associated harmful consequences.

OPEN ACCESS

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APPENDIX 17: AUTHOR'S CURRICULUM VITAE



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 Twitter: @cateamour

Email:  cmusyoka@cartafrica.org

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Address: Nairobi, 00100  Nairobi (Kenya)

ABOUT ME

I am a Clinical Psychologist and trainer with over 20-years of experience in clinical healthcare and clinical psychology. Over 10 years of experience are in teaching Mental Health at the college level both in the classroom setting and clinical areas. I research the psychology of substance use and its effects on the youth. My research focus is the use of technology (mHealth) interventions for substance use demand reduction and mental health practice among university students. I possess a strong intellect and have an amiable but tenacious approach to executing my responsibilities. I fit well in new and challenging environments and am able to work with minimal routine guidance

WORK EXPERIENCE

Program Coordinator Alcohol & Drug Abuse Prevention Program

University of Nairobi [01/04/2014 – Current]

Department: University Health Services

- Set up and operationalize the Employee and Student Wellness Department
- Management and supervision of departmental staff members
- Day to day running of the department, preparing and overseeing the implementation of standard operating procedures (SOPs) for diverse activities as part of the quality assurance and improvement system.
- Drugs demand reduction programs for university students, staff and their dependents including life skills training for both student and staff peer mentors in substance use prevention
- Diagnosis and treatment of both staff and students with substance use disorders. Counselling and psychological support of mental health-related concerns.
- Networking, linkages and referral of clients for specialized care as necessary and follow up while in treatment.
- Continuous surveys on the status of substance use and mental health research among the university community
- HIV/AIDS prevention activities among the University community including awareness and testing in various campuses; training and mentoring of students and staff in new advances in the management of HIV & AIDS; Program monitoring and evaluation; Preparing and overseeing the implementation of standard operating procedures (SOPs) for diverse activities as part of the quality assurance and improvement system.

Clinical Officer: University Health Services

Kenya Medical Training college Nairobi [10/01/2007 – 01/03/2014]

Address: Nairobi (Kenya)

As a clinical officer at the University Health Services, Students clinic I was tasked with various duties:

- Clerkship, diagnosis and management of both students and staff at the outpatient clinic
- Performed surgical management of both students and staff at the minor theatre
- Psychological support and counselling of both students and staff who presented with mental health challenges
- Attending departmental meetings

Clinical Officer

Ministry of Health-Mbagathi District Hospital [26/03/2003 – 31/12/2006]

Address: Nairobi (Kenya)

- Clerkship and treatment of patients at the busy outpatient department.
- Particular clerkship and treatment of HIV/AIDS patients with ARVs as well as supportive care.
- Counselling and psychological support of HIV patients and their families.

Orthopedic and Rehabilitative Clinical Officer in charge

Ministry of Health National Spinal Injury Hospital [28/09/2001 – 12/02/2003]

Address: Nairobi (Kenya)

- Clinical care and rehabilitative treatment of patients with spine injuries.
- Counselling and psychological support of spinal injured patients and their families.
- Supervision of the management of patients at the hospital outpatient clinic.

Clinical officer Intern

Ministry of Health Machakos Provincial hospital [21/01/1997 – 07/08/2001]

Address: Machakos (Kenya)

- Clinical care and management of patients admitted (3 months' rotations) in the medical, surgical, pediatric and obstetric and gynecological wards
- Treatment of outpatients and Performing minor surgical procedures, General duties in the accident and emergency clinic.

EDUCATION AND TRAINING Doctor of Philosophy in Clinical Psychology

University of Nairobi [05/09/2016 – Current]

Address: Nairobi (Kenya)

National classification: PHD

- Management of Psychological and Substance use disorders
- Psychometric assessments
- Research Methods in Public and Population Health
- Management of both quantitative and qualitative data
- Statistical data analysis and Data dissemination strategies

Master of Science in Clinical Psychology

University of Nairobi [01/09/2009 – 05/12/2013]

Address: Nairobi (Kenya)

National classification: MSc

- Childhood & Adolescent Psychological disorders
- Adult Psychological and Psychosexual Disorders
- Psychometric Assessments
- Research Methods

Bachelor of Science in Psychology

University of Nairobi [20/09/2004 – 06/12/2007]

Address: Nairobi (Kenya)

National classification: BSc

- Introduction to Psychology
- Human life cycle and Personality Development
- Learning, Cognition & Language
- Gender and Human sexuality
- social Psychology, Motivation & Emotion
- Psychological disorders and Counselling skills
- Research Methods

Higher National Diploma in Clinical Medicine & surgery

Kenya medical Training College [01/09/2001 – 31/08/2002]

Address: Nairobi (Kenya)

National classification: HND

- Orthopedic disorders Management
- Operations at Accident & Emergency department
- Care of the critically injured patient ◦
- Arthritis and metabolic bone diseases

Diploma in Clinical medicine & Surgery

Kenya medical training college [27/09/1993 – 06/12/1996]

National classification: Diploma

- Human Anatomy & Physiology, Microbiology, Surgery
- Medical disorders, Community Medicine and Parasitology

Consortium of A dvanced Research Training in Africa (CARTA) Doctoral Fellowship program

Africa Population Health Research Consortium [27/02/2017 – Current]

Address: Nairobi (Kenya)

National classification: PhD Fellowship

- Basic quantitative research methods, study designs and measures of association
- Selection of study population, validity and reliability, testing of parametric associations ◦
- Introduction to statistical software STATA, NVivo

- Hypothesis testing, confounding and effect modification
- Simple linear regression, Logistic and multiple regression
- Analysis of multilevel data, survival analysis
- Qualitative didactic sessions, generating qualitative data, in-depth interviewing and focus groups
- Data management and thematic analysis

DAAD Scholarship award

German Academic Exchange Service [30/08/2017 – Current]

Address: Nairobi (Kenya)

National classification: PhD Fellowship

A doctoral studies scholarship program

Project: Prevention of Alcohol and Substance Abuse: mHealth Based Peer Mentoring Among Students at the University of Nairobi

LANGUAGE SKILLS

Mother tongue(s):

English, Swahili Other

language(s):

Swahili

LISTENING C1 READING C1 WRITING C1

SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

DIGITAL SKILLS

Microsoft PowerPoint / Microsoft Word / Social Media / Zoom / Skype / Google Drive / Microsoft Excel / Good listener and communicator / Google Docs / Written and Verbal skills / Team-work oriented / Power Point / Motivated / Decision-making / Organizational and planning skills / Responsibility / Presenting

NETWORKS AND MEMBERSHIPS

Memberships

- Member of the International Society of Substance Use Professionals (ISSUP) -2017
- Member of the International Consortium of Universities for Drug Demand Reduction (ICUDDR)-2018
- Member of the Society for Prevention Research (SPR)- 2019
- Registered by Kenya Professional Counsellors Association (KUPCA) -2019
- Accreditation by the International Centre for Credentialing and Education of Addiction Professionals (ICCE) ICAP II -2014 to date
- Life Member, University of Nairobi Alumni Association

RECOMMENDATIONS

Prof. Muthoni Mathai
University of Nairobi
P.O Box 30197 00100 Nairobi
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Prof. Anne Obondo
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Tel +254 721 849 686

ORGANISATIONAL SKILLS

Organizational skills

- Leadership skills currently a leader of a team of 10
- Organizational skills gained as I set up the Alcohol & drug abuse prevention unit

COMMUNICATION AND INTERPERSONAL SKILLS

Communication and interpersonal skills

- Good communication skills gained in my work as a public speaker and talking to large crowds of people on topical issues.
- Good interaction skills gained working with the youth in the prevention of substance abuse prevention

JOB-RELATED SKILLS

Job-related skills

- Mentoring skills, as the program coordinator am responsible for the induction of new staff members and enhancing staff morale for optimum workplace service delivery.
- Organizational and report writing skills as the team leader
- Performance contracting implementation
- Negotiation, Linkages and networking and Fundraising

HONOURS, AWARDS AND GRANTS RECEIVED

Honors, Awards and Grants Received

- **April. 2019:** Grant Proposal Writing Training by University of Nairobi, the office of the Deputy Vice-chancellor Research, Production and Extension. (Value = \$500.00)
- **Sept. 2018:** German Academic Exchange Service (DAAD Scholarship) (Value = \$ 25,600.00)
- **Feb. 2017:** Consortium for Advanced Research Training in Africa (CARTA) PhD Fellowship (Value = \$100,000.00)
- **Sept. 2009:** Awarded the *Gandhi Smarak Nidhi Fund* (GSNF) post-graduate scholarship by the University of Nairobi 2009-2013. (Value = \$ 10,000.00)

CONFERENCE PRESENTATIONS

Conference Presentations

Musyoka C.M. *Design and Development of a Mobile Phone Based Decision Support app. for Substance Use Screening and Referral in a resource Limited University Setting*, Society for Prevention Research 27th Annual Meeting, Hyatt Regency, San Francisco, CA, Tuesday, May 28, 2019 - Friday, May 31, 2019.

Musyoka C.M. *Demand reduction strategies for Alcohol and Substance Use among University Students*. The Joint University of Nairobi Management and University Student Association Leaders retreat. The Mombasa Beach Hotel, Mombasa, Kenya. June 25-29, 2018.

Musyoka C.M. *Models and Approaches to Alcohol and Drug Addiction Rehabilitation in Kenya*, Joint NACADA, ISSUP and African Union Drug Demand Reduction Conference & Workshop at KICC Nairobi, Kenya. December 10-14 2018

Musyoka C.M. *Peer mentoring for substance use prevention among university students* Consortium for Advanced Research Training in Africa (CARTA) Joint Advanced Seminar, Kampala, Uganda. March 22, 2017.

Musyoka C.M. *Prevention of Alcohol and Drug Use in the Workplace* Training Symposium for University of Nairobi Staff, Nairobi. June 24 –26, 2016.

CONTINUOUS PROFESSIONAL DEVELOPMENT COURSES

Continuous Professional Development courses

- **July 29-August 30 2019:** University College Hospital (UCH) Ibadan, Nigeria. Qualitative and quantitative data analysis and academic writing.
- **July 31-August 30 2018:** Summer school at Heidelberg Institute of Public Health University Germany. Training on Enhancing qualifications for Teaching and Research in Public Health, I gained skills and competences in intercultural relations, teaching didactic, research and grant proposal writing and poster presentations. Developed and exhibited in a poster presentation symposium at the Heidelberg Institute of Public Health.
- **May 14-18th 2018:** Training on Use of Redcap application for data collection and management APHRC-Nairobi Kenya
- **December 18-19th 2017:** Workshop on Data dissemination strategies and statistical data analysis JKUAT, Kenya
- **November 5-30th 2017:** Advanced training in research methods in public and population health University of Witwatersrand Johannesburg
- **September 7-9th 2015:** Malaria Case Management Training- **Nairobi**
- **July 2015:** International Center for Certification and Education of Addiction Professionals (ICCE-II Clinical Level)
- **January 2013:** Addiction certification by NACADA
- **December 2012:** Cooperate management training by Kenya School of Government
- **August 2009:** NACADA Training of Trainers course on Alcohol and Substance Abuse course Nairobi Kenya
- **April and Sept. 2006:** Medicines Sans Frontiers' (MSF) 9-week course (split into two sessions) on HIV comprehensive care and Anti-Retroviral (ARVs) therapy.
- **April 2006:** MOH/NASCOP's 2-weeks course on Prevention of Maternal to Child Transmission (PMTCT) of HIV infection and Voluntary Counseling and Testing (VCT).
- **February 2006:** WHO/MOH's 2-week course on Integrated Management of Childhood Illnesses (IMCI).

- **July 2001:** MOH's 6-week course on Maternal and Child Health and Family Planning.

RESEARCH AND PUBLICATIONS

- **August 2020-** Alcohol and substance use among first-year students at the University of Nairobi, Kenya: Prevalence and pattern PLoS ONE 15(8): e0238170. <https://doi.org/10.1371/journal.pone.0238170>
- **May 2020-** mHealth-based peer mentoring for prevention of alcohol and substance abuse among first-year university students: protocol for quasi-experimental intervention *published by Journal of substance use* DOI: 10.1080/14659891.2020.1766131
- **December 2016-** Models and Approaches to Alcohol and Drugs Addiction Rehabilitation in Kenya. *Published by International Journal of Health and Psychology Research* Vol.4, No.4, pp1-12, December 2016. (www.eajournals.org)
- **Sept. 2013-** A situation analysis of the treatment models used in registered drug addiction treatment centers in Kenya. The University of Nairobi repository