# COST EFFECTIVENESS OF COMMUNITY BASED AND INSTITUTION BASED DETOXIFICATION AND REHABILITATION OF ALCOHOL DEPENDENT PERSONS IN KENYA

Ph.D. THESIS IN PSYCHIATRY

UNIVERSITY OF NAIROBI

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## Declaration

I Mary Wangari Kuria hereby declare that this thesis is my original work and I have not presented it to any other university for the award of a degree or doctorate.

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## Approval

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## Dedication

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## Abbreviations and Acronyms

| | |
|---|---|
| AA: | Alcoholic Anonymous |
| BNKE: | Basic Needs Kenya |
| AMHF: | Africa Mental Health Foundation |
| ASSIST: | Alcohol Smoking Substance Use Identification Screening Test |
| ADHD: | Attention Deficit Hyperactivity Disorder |
| AUDIT: | Alcohol Use Disorder Identification Test |
| BAC: | Blood Alcohol Concentration |
| CAPI: | Computer Assisted Personal Interview |
| CBDR: | Community Based Detoxification and Rehabilitation |
| CIDI: | Composite International Diagnostic Interview |
| CBHW: | Community Based Health Worker |
| CEA: | Cost Effective Analysis |
| CNS: | Central Nervous System |
| DALYs: | Disability-adjusted life years |
| DCP: | Disease Control Priorities |
| DTs: | Delirium Tremens |
| DSM-IV: | Diagnostic and Statistical Manual Volume 1V |
| FASD: | Fetal Alcohol Spectrum Disorders |
| GAD: | Generalized Anxiety Disorder |
| GP'S: | General Practitioners |
| IBDR: | Institution Based Detoxification and Rehabilitation |
| ICD-10: | International Classification of Diseases Volume 10 |
| IV: | Intravenous |
| KAWE: | Kenya Association Welfare for Epilepsy |
| KEBS: | Kenya Bureau of Standards |
| KHC: | Kangemi Health Center |
| KNH: | Kenyatta National Hospital |
| LMIC: | Low and Middle Income Countries |
| NA: | Narcotic Anonymous |
| NACADA: | National Agency for the Campaign Against Drug Abuse |
| NGO's: | Non Governmental Organizations. |
| NSS: | Not Statistically Significant |

| | |
|---|---|
| PAPI: | Paper and Pencil |
| PI: | Principal Researcher |
| PPM: | Parts per Million |
| RBT: | Random Breath Test |
| SDQ: | Socio demographic Questionnaire |
| SS: | Statistically Significant |
| TV: | Television |
| USA: | United States of America |
| USD/$: | United States Dollar |
| WKS: | Wernicke- korsakoff syndrome |
| WHO: | World Health Organization |

## Definitions and operational terms

Cost effectiveness in a health intervention is the quantifiable, significant results obtained from the intervention (Jamison, et al., 1993). A cost effective intervention is one that has a relatively low ratio of cost to effectiveness.

Disability adjusted life years (DALYs) is a composite measure that combines years lived with disability and years lost to premature death in a single metric unit (Laxminarayan, R. et al., 2006), or a gap measure comparing to an ideal standard in this case living without disability with the highest life expectancy possible (Rehm, et al., 2007).

Cost-effectiveness ratio is the price of equivalent units of health using different interventions.

'A drug is any chemical substance or a mixture of substances which when introduced into the living organism may modify one or more of its functions' (APA, 1994).

'Substance abuse is persistent and/or excessive use of a drug inconsistence with or unrelated to medical practice, resulting to harmful effect. It is characterized by the presence of at least one specific symptom that indicates that the substance use has interfered with the person's life' (APA, 1994).

'Drug dependence is a cluster of physiological, behavioural and cognitive phenomena in which the use of a substance or class of substances takes on a much higher priority for a given individual than other behaviours that once had greater value' (WHO, 1992).

'Harmful drinking is defined as alcohol consumption that results in adverse effects (e.g., physical or psychological harm)' (WHO, 1992).

Hazardous drinking is defined as a 'quantity or pattern of alcohol consumption that places patients at risk for adverse health effects' (Saunders et al.., 1993).

'Heavy drinking is defined as a quantity of alcohol consumption that exceeds an established threshold value. The National Institute of Alcohol Abuse and Alcoholism sets this threshold at more than 14 drinks per week for men (or >4 drinks per occasion); more than 7 drinks per week

for women (or >3 drinks per occasion); and more than 7 drinks per week for all adults 65 years and above' (NIAAA, 2000).

A health intervention is a deliberate activity that aims to improve someone's health by reducing the risk, the duration, or the severity of a health problem and accident, contracting an infection, or suffering from a malignant tumour.

A Standard Drink in different countries, health educators and researchers employ different definitions of a standard unit or drink because of differences in the typical serving sizes in that country, for example,

a) 1 standard drink in Canada: 13.6 g of pure alcohol.
b) 1 standard drink in the UK: 8 g of pure alcohol.
c) 1 standard drink in the USA: 14 g of pure alcohol.
d) 1 standard drink in Australia or New Zealand: 10 g of pure alcohol.
e) 1 standard drink in Japan: 19.75 g of pure alcohol.

Kenya (a former British colony) employs the UK definition of a standard drink.

The community based health workers (CBHW) are volunteers who live and work within the community. The CBHW involved in this research were trained by the Africa Mental Health Foundation (AMHF) in collaboration with the Basic Needs Kenya. They are important especially in follow up of patients within the community and act as a link between health workers and the community.

The Kangemi mental health programme is part of basic needs/basic rights community mental health initiative by Basic Needs U.K in Kenya, a Non Governmental Organization (NGO) involved in initiation and implementation of community mental health treatment in the developing countries. This embraces the following: The Kenya Association for the Welfare of Epileptics (KAWE), an organization that caters for epileptics, Africa Mental Health Foundation (AMHF) responsible for documentation and research, Schizophrenia Foundation which cares for the schizophrenic patients within the community, Mental health clinic which operates once a week for the follow-up of patients with psychiatric problems.

## Abstract

Government and non governmental agencies the world over, have recommended that drug abuse be dealt with, primarily as a community problem. Community based rehabilitation of patients with various conditions has been tried elsewhere and found to be cost effective. The World Health Organization (WHO) advocates use of community based health services as means of reaching a large number of people at a low cost. However in Kenya and Africa in general the concept of community based treatment and rehabilitation of persons abusing drugs have not been embraced neither has the effectiveness of various types of alcohol dependence treatment been explored in research. There is therefore need for alcohol dependence treatments to be evidence based and to bridge the gap between knowledge and actual practice.

The goal of the study was to provide research based evidence on the cost and effectiveness of community based detoxification and rehabilitation of alcohol dependent persons in Kangemi informal settlement located in the west of Nairobi and compare it with that of institution based detoxification and rehabilitation of alcohol dependent persons. One hundred eighty eight alcohol use disorder identification test (AUDIT) positive alcohol dependent persons were purposively selected to represent the community based group. They were then subjected to alcohol detoxification for 10 days using pabrinex 1& 11 intravenously daily for 3 consecutive days, diazepam 5mg and carbamazepine 200mg for 5 and 10 consecutive nights respectively on outpatient basis. Pabrinex is parenteral high potency Vitamin B and C combination from Phillips pharmaceuticals.

A researcher designed socio demographic questionnaire (SDQ) was administered to provide necessary information including that which was needed for follow up of participants. Alcohol Smoking Substance use Identification Screening Test (ASSIST) and Composite International Diagnostic Interview (CIDI) instruments were administered before detoxification and at the end of six months to determine alcohol related problems and co morbidity, respectively. The community based participants were visited twice a week (at home) by the community based health workers and reviewed once a week by the principal investigator and/or a clinical psychologist and a bimonthly group therapy conducted in groups of 20s. The groups were converted to self-help groups after 4 months to generate income for the participants.

Eighty-eight participants admitted in 3 rehabilitation centers over the period of study formed the institution-based group and were similarly subjected to AUDIT, SDQ, ASSIST and CIDI. The follow-up for this group was done after six months (three months after discharge) on telephone and the post test ASSIST and CIDI questionnaire could not be administered to the institution based group at six months since the participants had been discharged three months before. The cost of treatment was obtained for both the community based and the institution based detoxification and rehabilitation groups. Fourteen alcohol samples were collected from the community-based field of study and analyzed for the ethanol and methanol levels.

Over ninety eight percent (98.9%) of the community based and 91.5% of the institution based group participants were male. The mean AUDIT score for the community based group males was 28.6 as compared to a mean score of 15.8 for the males in the institution-based group. There were statistically significant differences in the education level, type of occupation and income for the two groups with the community-based group being more disadvantaged as compared to the institution based group. Similarly the co morbidity and level of alcohol use was significantly higher in the community based group. The age onset of alcohol use by the community and institution group was early with no statistically significant differences in the two groups (54.4% of the institution and 43.2% of the community based groups beginning to use alcohol before the age of 18 years).

The levels of hazardous drinking and alcohol dependence were significantly higher in the community based group when compared to the institution based group. However there were no statistically significant difference in alcohol related problems and harmful drinking. High level of psychiatric co morbidity was present in both community based and institution based participants.

One hundred and thirty (130) out of the 188 who had enrolled in the community based study group completed the six months treatment with 56.9% participants remaining abstinent for the entire period. Seventy nine out of the 88 participants of the institution based group were contacted at six months, 44.3% of them were abstinent for the entire six months of study.

There was a statistically significant reduction in the levels of co morbidity and alcohol related problems in the community based group after six months of treatment.

The analysis of alcohol samples collected from field of study found anomalies between the actual and the Kenya Bureau of standards recommended ethanol content in some of the samples

Randomization of the community and institution based groups was not possible before intervention because of ethical and logistical reasons. This complicated the comparison of effectiveness of the community based and institution based interventions. This notwithstanding, community based detoxification and rehabilitation was found to be more effective, safe, affordable and therefore feasible.

# Chapter One

## 1.0 Introduction

## 1.1 History of alcohol in Africa and the current situation

In the pre-colonial era in Africa, alcohol was produced locally either by tapping it from palm tree (palm wine) or from fermentation of cereals or distillation of palm wine into spirits (Odejide, 1989). In the latter part of the 19th century industrialized spirits were introduced into by western traders who doubled as slave traders (Pan, 1975). In many African societies only male adults used alcohol as a means of socialization. Alcohol was used during weddings, religious festivities, and rituals, naming ceremonies and settling dispute (Acuda, 1985; Hagaman, 1980; and Wolcott, 1994).

However in the recent past there has been a change in the mode and reasons of using alcohol. Socio cultural changes that have occurred in Kenya have reduced the cultural control on alcohol drinking, contributing to increased risk of excessive drinking which exposes the person to health and other complications. Alcohol use is becoming more and more dangerous as traditional norms of use disappear (Obondo, 1998).

The effects of alcohol dependence are a problem the world over, but in Africa, challenges related to other health problems receive more attention than the problem of alcohol dependence. This is partly due to Africa's low socio economic state, but largely due to the false belief and attitude among many including policy makers that alcohol and substance dependence and abuse are not prevalent in Africa. Indeed some policy makers in Kenya have been pushing for legalization of traditional brews to be sold in the market along side the other brews (Mathenge, 2006).

## 1.2 Treatment of alcohol dependence

Published data on types of treatment available in the low and middle income countries (LMCI) is scarce and Perngparn et al., (2008) reports a dearth of scientific literature on prevention, treatment and rehabilitation in middle-income countries. In addition the authors report a lack

of novel effective approaches to treatment during the review period of June 2006 to December 2007 (Perngparn, et al., 2008). The World Health Organization encourages governments and other partners to take concerted action, for the implementation of evidence based drug dependence treatment services which respond to the needs of their populations (WHO, 2008).

Treatment of alcohol dependence in Kenya is mainly institution based with no documented data on outpatient and community based treatment. In the 63 registered rehabilitation centres (NACADA, 2008), patients are admitted for 90 days mainly without undergoing detoxification. A minority group undergoes detoxification in private hospitals before being referred to the rehabilitation centre of their choice. Only one public rehabilitation centre with a bed capacity of 45 persons exists in the country. In addition alcohol studies on alcohol in Kenya are on prevalence of alcohol abuse (Dhaphale, et al., 1982; Kuria, 1996; Ndetei, et al., 1997; NACADA, 2004), but anecdotal reports indicate that alcohol dependence is prevalent especially in the informal settlements where illicit brews are more easily available. Further there is lack of an alcohol policy with the few existing laws being poorly enforced. Treatment facilities for individuals are absent at primary health care level with no regular screening for alcohol and other substance abuse and dependence. With many medical professionals unable to recognize alcohol and substance related disorders referral to centres of treatment is not prompt and this results in delay in treatment. It has been shown that surgeons and nurses detect only 23% of their patients with substance abuse (Lappalainen, et al., 2005). There is high prevalence of psychiatric morbidity (including substance abuse related disorders) in Kenyan general medical facilities, but this largely goes undiagnosed and therefore, unmanaged (Ndetei et al., 2009).

Institution based treatment is the standard form of treatment and currently no alternative modes of treatment have been documented in Kenya. Institution based treatment is generally expensive and often inaccessible to the majority of Kenyans who have no insurance cover and have to pay from their usually low incomes to treatment institutions that are almost exclusively private.

## 1.3 Cost effectiveness

In spite of dramatic improvement on Human health during the last century, grave inequities in health still persist. Laxminarayan, et al., (2006) suggests that it is important to deploy available resources effectively in order to progress in health, meet new challenges and redress inequities, This requires knowledge about which interventions actually work, information about how much they cost, and experience with their implementation and delivery (Laxminarayan, et al., 2006). Other researchers agree that knowing the potential costs and outcomes of different choices in treatment enables the clinician to make the best decision for a given patient (Eddy, 1990; Weinstein, et al., 1977). Understanding the cost and effectiveness of an intervention will help in implementation of interventions that are more cost effective, benefiting larger populations of alcohol dependent persons.

Cost effectiveness analysis (CEA) is a technique for selecting among competing wants whenever resources are limited. The technique is useful for comparing the relative value of various clinical strategies. In its most common form a new strategy is compared with a current practice (American College of Physicians, 2000). Cost effective analysis is a useful tool in selecting clinical guidelines especially in situations that resources are scarce. Such clinical guidelines should optimize on population effectiveness reflect individual needs less. Managed care organizations and other resource allocating decision makers may however find it difficult to balance individual and societal priorities (Granata, et al., 1998).

Consequently, to allocate resources as efficiently as possible, decision makers should consider several factors. These factors include the clinical needs of their constituencies, their financial constraints, traditional cost effectiveness rankings (which evaluate the efficiency of clinical alternatives for individual patients), and cost effectiveness rankings based on optimal values for an entire population.

Community based treatment of drug dependence has been recommended as a good treatment approach (WHO, 2008). Although community based detoxification and rehabilitation have successfully been studied and applied elsewhere and found to be cost-effective (Soyka, 2004), no documented research has been done in Kenya to establish its feasibility, safety and effectiveness. The current pioneer study aims at studying the cost effectiveness of community

based detoxification and rehabilitation of alcohol dependent persons and compares it with the traditional institution based treatment of alcohol dependence.

## 1.4 Study Background

The extents of alcohol abuse and related problems have been demonstrated both in scientific research and anecdotal reports (Dhadphale, et al., 1982; Kuria, 1996; Ndetei, et al., 1997; NACADA, 2004; Shafer, et al., 2004, W.H.O 2004(a); Mwandambo, 2005; Amadala, et al., 2007). A baseline study sponsored by Basic Needs Kenya (BNKE) NGO, showed that alcohol abuse and dependence was prevalent in Kangemi location, and that many of the alcohol dependent persons lived in poverty, crime and divorce (Ndetei, et al., 2006). The extent of the problem is also demonstrated by anecdotal reports in the media, of Kangemi women demonstrating on the streets of Nairobi city to voice their grievances. Among the grievances include "men getting lost in "changaa" (illicit brew) dens, male impotence, absconding family responsibilities, trading family items in exchange for alcohol, loss of jobs, physical injuries resulting from falls, fights or accidents, children failing to attend school due to either their alcohol drinking problem or that of their parents' (Kimani, 1999). High rates of unemployment are also reported with a resulting high crime rate. To quote the women, 'our sons remain unmarried because they lack the desire for women' (Kimani, 1999).

Alcohol is the most abused substance in Kangemi, and is obtained from unregulated local brewers (examples of such drinks are 'busaa,' 'kumikumi,' 'muratina',), (Ndetei, et. al., 2006). Other unregulated local brews include 'changaa', 'mnazi', 'kiruru', 'kairasi', 'mbanguri, 'mti ni dawa' among others. Many of those dependent on alcohol are willing to stop drinking, but are unable due to the discomfort and danger resulting from untreated withdrawal symptoms. In addition, the cost of treatment in existing rehabilitation institutions is prohibitive to many of the alcohol dependent persons especially those living in informal settlements. The BNKE NGO has initiated programmes that cater for patients suffering from schizophrenia, epilepsy and HIV/AIDS within the Kangemi community, but none exist to address the alcohol and substance abuse problem.

A mental health clinic has been in operation over the last one year during which the medical professionals at the centre have identified alcohol abuse and dependence as a major problem in

the area. No programme has been instituted for alcohol abuse and dependent patients (Ndetei, et al., 2006). There is need for research based cost effective strategies of managing alcohol dependence in Kangemi area and in Kenya in general. The current study was a response to the said need.

# Chapter Two

## 2.0 Literature review

### 2.1 Prevalence of alcohol abuse and related problems

Alcohol is the most used drug in almost every culture throughout the world. (Holmawood, 2002) and is overwhelmingly consumed mostly by those 15 years and older (Rehm, et al., 2007). It is licit in most nations, but outlawed in a few nations mainly for religious reasons. Globally, less than one half of the adult population (about two billion people) uses alcohol with abstention rate being higher among females (66%) than among males (45%), (WHO, 2007). Worldwide in 2002, there were more abstainers than drinkers.

However, alcohol is consumed in a way that is detrimental to health in most regions of the world (Rehm, et al., 2007). Spirits represent the most prevalent type of beverage around the world and unrecorded consumption is still relatively high on global level making up to about 28% of the total consumption (Rehm, et al., 2007). In both the developed and the developing world, a relatively large proportion of the alcohol is consumed by a relatively small proportion of the population (Rehm, 1998; Gmel and Rehm, 2004; Rehm, et al., 2004(a)).

According to the (2004) estimates, out of the about 2 billion people consuming alcoholic beverages worldwide, 76.3 million have diagnosable alcohol use disorders. From a public health perspective, the global burden related to alcohol consumption, both in terms of morbidity and mortality, is considerable in most parts of the world (WHO, 2004 (a)). Globally, alcohol consumption causes 3.2% of deaths (1.8 million) and 4.0% DALYs lost (58.3 million) (WHO, 2004(a)) compared to 4.1% for tobacco (Rehm, et al., 2003(a); Rehm, et al. 2004(a). Alcohol is one of the most important risk factors for global burden of disease ranking fifth just behind tobacco (Ezzati, et al., 2002; WHO, 2002; World Advertising Research Centre Ltd, 2005).

Violence, vehicle accidents and unsafe sexual practices are some of the consequences of excessive alcohol consumption (Parry, et al., 1999, 2000, Jernigan, 2001). The globally

increasing trend of poly substance use results to increase in risks associated with alcohol consumption (Edwards, et al., 2003).

Alcohol dependence is a leading cause of morbidity and premature death (Theodore, et al., 1998) with reports from Northern California indicating that excessive mortality associated with heavy alcohol drinking was observed for cancer, cardiovascular disease and injuries (Hunkeler, et al., 2001).

Studies have shown that people who drink alcohol before age 15 years are 4 times more likely to develop alcohol dependence at some time in their lives as compared to those who first drink at age 20 or older (Dawson, et al., 2000), this may either mean that starting to drink earlier actually causes alcoholism or it may be due to existing vulnerability to alcohol use disorders (Rose, et al., 1998). Consequently alcohol use and abuse preventive measures should target the children and young people to be effective.

Orgborne, et al. (1998) reports that out of the approximately 78% of Canadians consult a physician each year, 6% are heavily dependent on alcohol, 25% have or are at risk for alcohol related health problems. Further, hazardous drinking causes about 10% of premature deaths in Canada and more than 50% of fatal traffic accidents involve alcohol (Orgborne, et al., 1998). These results to a health, social and economic cost of alcohol abuse been as high as 8.6 billion, of which 1.3 billion is spent on direct health cost (Orgborne, et al., 1998).The health systems in the developed countries are more efficient in handling alcohol related problems than those in the developing countries.

In a research done in the USA, the prevalence of lifetime and 12-month alcohol abuse was 17.8% and 4.7% respectively; prevalence of lifetime and 12- month alcohol dependence was 12.5% and 3.8% respectively (Hasin, et al., 2007). Alcohol dependence was significantly higher among men, whites, Native Americans, younger and unmarried adults, and those with lower income (Hasin, et al., 2007).

In Kenya and other developing countries the screening for substance related disorders is not routinely done at the primary, secondary or tertiary (national referral hospitals) and many of the health workers are not well informed on how to help patients with substance related problems (Ndetei, et al., 2009). This was demonstrated by a research done among patients

attending general health facilities in Kenya, in which, 25.2% of the sample used alcohol with 75.9% requiring brief intervention and 1.4% requiring more intense treatment (Ndetei, et al., 2006).This, in a situation where treatment facilities and rehabilitation centres for alcohol dependent persons are few and resources are scarce, complicates the situation. In addition, there is no published data on the effectiveness of treatment at the rehabilitation centres.

In a review article on drug therapy for dependence Swift states that alcohol dependence affects nearly 10% of the population and results in social problems, considerable morbidity and mortality, and high health costs (Swift, 1999). This is consistent with findings by Peltzer, et al., 2006 in a primary care outpatient sample of rural South Africans where, 37.7% of men and 10.7% of women were hazardous drinkers, and 9.2% of men and 0.3% of women met criteria for alcohol dependence as defined by AUDIT.

Alcohol is the most abused substance among school children, college students and adults in Kenya (Dhadphale, et al., 1982; Kuria, 1996; Ndetei, et al., 1997; NACADA, 2004). These studies also report that for all age groups, males abuse alcohol more than females, however most of the studies in Kenya have focused on prevalence rates of alcohol use and abuse in children and there is no documented prevalence rate of alcohol dependence in the general population in Kenya though this is likely to be similar to that of South Africa (Peltzer, et al., 2006) and that stated by Swift, (1999).

Potent and cheap home brewed alcohols are available in Kenya. Quality control on these brews is virtually absent and the ethanol content is occasionally high. But more serious is the possibility of contamination with methanol and other dangerous chemicals. Such contamination has resulted to mortalities and disabilities including blindness in the past (Odalo, 2007).

The alcohol situation is not different in the other African countries. In South Africa, among patients in specialized substance abuse treatment centres, alcohol is the primary substance of abuse reported in eight of the nine South Africa provinces, and in Western Cape methamphetamine is abused (Pluddemann, et al., 2008).

The extent of alcohol use among Zimbabwean adolescents is limited to surveys of 'in-school' youth (Eide and Acuda, 1995, 1996) largely due to their relative ease of accessibility.

According to surveys of secondary school students from urban and rural Zimbabwe, alcohol use was most common among urban boys of low to medium socioeconomic status (36% lifetime prevalence) and among urban girls and boys of high socio economic status (43% and 46% lifetime prevalence, respectively) (Eide and Acuda, 1995; Eide and Acuda, 1996).

In Africa many people abstain from alcohol but those that drink, drink a lot (Jernigan, and Obot, 2006). The current trend by alcohol marketing targets the youth and studies have implicted this to the increase in alcohol consumption (Odejide, et al., 1987; Adelekan, et al., 1993; Parry, et al., 1999). In terms of differences between sexes, Africa does not differ from the rest of the world. More women than men are abstainers, defined in this case 'as people who did not drink any type of alcohol beverage in the year preceding the survey' (Obot, 2006).

Data suggest an increase in lifetime drinking among young, black African males and females; and that women may use alcohol and other drugs as a way to cope with current or past life stressors (Sawyer, et al., 2006; Morojele, et al., 2006). Alcohol use and consumption in Africa has currently been on the increase with the underage and young persons (ages 10 to 25 years) of both sexes (Odejide, 2006).

In Kenya, alcohol consumption is highest in poor communities where potent home brewed alcohol is cheap and readily available. Quality control is weak, meaning ethanol content can at times be dangerously high (Morris, et al., 2006), examples of such home made brews include, 'muratina', 'mnazi', 'changaa', 'mbangari', 'busaa', and 'kumikumi'. Rocha (2001) indicates that heavy use of illicit drug has. Spread from urban and historically advantaged groups to rural areas and disadvantaged groups (poor communities) has been reported. Such poor youth of such poor communities tend to associate alcohol use with fun, enjoyment and survival (Rocha, 2001).

The recorded per capita consumption of alcohol in Kenya is 1.74 litres of ethanol per capita with an unrecorded consumption of 5 litres per capita (WHO, 2004(a)); Rehm, et al., 2004(b)). Data for other Eastern African countries shows that Uganda has a higher per capita consumption of both recorded (19.47) and unrecorded (10.7), while Tanzania has a recorded per capita consumption of 5.29 and an unavailable data for the unrecorded consumption (WHO, 2004(a); Rehm, et al., 2004(b)).

In Africa, both local and industrialized types of alcohol are used and abused (Riley and Marshall, 1999), with as much as half of the consumption being unrecorded alcohol (home production or traditional beverages) (Rehm, et al., 2003(b)). The use of the local traditional brews poses a danger to the society for a number of reasons. Firstly, most of the brews are manufactured illegally without control on the ethanol content. Secondly, the cost of the brews is relatively lower than that of the legal brews and therefore the majority of the alcohol users can afford it. Thirdly, the manufacture of the traditional brews is usually unhygienic and at times the brews have been laced with methanol resulting to deaths blindness and disabilities (Nordwall, 2000; Nation correspondent, 1999; Wanjiku, 1999; Odalo, 2007; Mwandambo, 2005; Kebati, et al., 2006).

Traditional drinks including home made brews and distilled beverages accounts for 74% of the total alcohol consumption in Kenya (Obot, 2006). Some of the traditional drinks are licit while others are illicit.

The three Eastern Africa countries have a pattern score of alcohol drinking as 3 (Obot, 2006). Alcohol pattern score ranges from 1(least hazardous) to 4(most hazardous) It is an estimate of the level of hazard that might result from drinking alcohol, and some of its determinants include number of heavy drinking occasions, high usual quantity of alcohol consumed, drinking in public places and drinking at community festivals (Obot, 2006).

The per capita consumption of alcohol is generally low in East Africa as compared to Europe. However the drinking pattern of Africa is one that poses potential health and social harm (Obot, 2006). Alcohol, cigarettes and 'miraa' (khat) are considered to be gateway drugs to abuse of other substances in Kenya and are prevalently used in that order (NACADA, 2006).

Majority of Kenyans use alcohol in a hazardous way as demonstrated by a study done among persons attending both urban/ hospital based and rural clinics in western Kenya, where, 54% of participants reported hazardous drinking behaviour (Shaffer, et al., 2004). Hazardous drinking was more prevalent among men attending the rural health clinics. Further, the study participants were fairly young (38+/-9 years) and home made alcohol was commonly drunk by patients attending the rural health centre, while commercial beer was more drank by those attending the teaching and referral hospital (Shaffer, et al., 2004).

In spite of the high health and social economic costs most African governments depend heavily on alcohol beverage industries for revenue received through alcohol sale taxation. These coupled with employment opportunities for people gives the alcohol industries a bargaining power when it comes to introduction of alcohol policies in Africa.

## 2.2.0 Diseases and Injuries Related to Alcohol Use/Abuse

Alcohol dependence and alcohol abuse or harmful use causes substantial morbidity and mortality. Overall, there are causal relationships between alcohol consumption and more than 60 types of disease and injury (WHO, 2002). Alcohol consumption is the leading risk factor for disease burden in low mortality developing countries, and the third largest risk factor in developed countries (WHO, 2002). In Europe alone, alcohol consumption was responsible for over 55 000 deaths among young people aged 15 to 29 years in 1999 (Rehm and Gmel, 2002).

Alcohol related harm has been reported in various African countries (Asuni, et al., 1986; Ohaeri, et al., 1993; Odejide, et al., 1987; Parry, et al., 1999) with South Africa documenting the health, social and economic consequences associated with problematic alcohol use(Parry, 2000), and Kenya reporting enormous socio economic effects of alcohol dependence in the family(Obondo, 1998). The socio economic effects included marital disharmony, violence and quarrels, sexual difficulties, poor family interaction, juvenile drinking and delinquency, poor school attendance, poor academic performance, financial difficulties and health problems (Obondo, 1998).

Furthermore, an early onset of regular alcohol consumption has been found to be a significant predictor of lifetime alcohol-related problems (Chou and Pickering, 1992, Kraus, et al., 2000), at least for some Western countries. Some of the diseases and injuries related to alcohol consumption are discussed below.

## 2.2.1 Fetal Alcohol Spectrum Disorders (FASD)

Alcohol has for a long time been associated with fetal abnormalities. Alcohol crosses the placental barrier and has been known to stunt growth or weight, create distinctive facial

stigmata, damage neurons and brain structures, and cause other physical, mental or behavioural problems (Ulleland, et al., 1972).

The term fetal alcohol spectrum disorders (FASD) is not in itself a clinical diagnosis but describes the full range of disabilities that may result from prenatal alcohol exposure. The term describes a 'continuum of permanent birth defects caused by maternal consumption of alcohol during pregnancy, which includes, but is not limited to fetal alcohol syndrome' (FAS) (Ratey, 2001). The consequences of FAS are life long, and the behavioural and learning difficulties are often greater than the degree of neurocognitive impairment. In women with a history of alcohol use during pregnancy, in-uteri alcohol syndrome should be considered when their babies develop growth deficiency, select facial abnormalities involving the appearance and eyes and neuron development abnormalities (Canadian Pediatric Society, 2002).

Alcohol related neuro developmental disorder also is a clinically recognizable diagnosis in the continuum of FASD and describes the clinical outcome when the facial features typical of FAS are absent (Wattendorf, et al., 2005). Although FASD is more strongly associated with higher levels of alcohol consumption compared with lower levels, animal studies have suggested that even a single episode of consuming the equivalent of two alcoholic drinks during pregnancy may lead to loss of fetal brain cells (Olney, 2004).

Maternal factors that increase the risk of FASD include being older than 30 years, a history of binge drinking, and low socio economic status (Sokol, et al., 2003).The risk of brain damage exists during each trimester since the fetal brain develops throughout the entire pregnancy (Guerri, et al., 2002).

Although the prevalence of fetal alcohol syndrome has not being documented in Kenya, South African females report an extremely high prevalence of fetal alcohol syndrome among South African children in several communities (Viljoen, et al., 2009).

### 2.2.2 Brain damage

Underage drinking can result to alteration in brain development that may have consequences reaching far beyond adolescence with key process of brain development possibly leading to

mild cognitive impairment as well as to further escalation of drinking, subtle alcohol induced adolescent learning impairments (which could affect academic and occupational achievement) may be induced by exposing brain to alcohol even during adolescence (Spear, 2002). In addition, adolescents who began drinking at an earlier age had a proportionately small hippocampus volumes compared with those who began later (De Bellis, et al., 2000) suggesting that the difference in size were alcohol induced.

### 2.2.3 Gastrointestinal Problems

Heavy drinking of alcohol causes gastrointestinal problems (Schuckit, 2009). In addition, numerous cases of alcohol poisoning, (the result of acute toxic effects of alcohol that range from gastritis to severe gastrointestinal bleeding to respiratory arrest and death), have been reported in the news media (National Institute on Alcohol Abuse and Alcoholism, 2000).

### 2.2.4 High Risk Sex

Cavazos et al. (2007) found that alcohol dependence in young adults is associated with having a high number of sex partners, with 45% of the alcohol dependent participants reporting having 10 or more sexual partners, (Cavazos, et al., 2007). Alcohol causes disinhibition, which results to careless sexual behaviour (Shaffer, et al., 2004). Episodes of drinking among adolescents and adult have been linked with unplanned and unprotected sex, (McGue, et al., 2001; Hingson, et al., 2006).

A study done in Western Kenya among persons with and without human immunodeficiency virus (HIV) recommends that effective interventions for HIV /AIDS must include a concerted effort to reduce hazardous drinking (Shaffer, et al., 2004). Many people at risk for or infected with are heavy alcohol drinkers.

High risk sex includes multiple sexual partners and failing to use condoms. The probability of sexual intercourse is increased by drinking amounts of alcohol sufficient to impair judgment but can also be decreased by drinking heavier amounts (Sen G, 2002). The association between alcohol use, reduced sexual inhibition, and individual behaviour has been demonstrated by several studies in both developed and developing countries (Cook, et al., 2005(a); Klinger, et

al., 2006; WHO, 2005). Population based evidence also exist which link between sexual behaviour and alcohol use (Chesson, et al., 2003; Lugalla, et al., 2004).

Alcohol is particularly problematic among groups that are at increased risk of HIV infections including mobile populations, commercial sex workers and youth (Amayo, 1996, Sam, et al., 2006). Both HIV infection and heavy alcohol use adversely affect the immune system and central nervous system (CNS) function (Meyerhoff, et al., 1995). Consequently programmes that address issues related to HIV/ AIDS must address alcohol related issues to be effective.

### 2.2.5 Accidents and Alcohol Related Injuries

Data from the USA shows that Alcohol is a leading contributor to injury or death and the main cause of death for people under age 21 (Smith, et al., 1999). Early drinking onset has been linked, after episodes of drinking among both adolescents and adults to unintentional injuries, motor vehicle crashes, physical fights, nicotine dependence, illicit substance use and conduct disorder (McGue, et al., 2001).

In a national epidemiologic survey in the USA, approximately 1 million frequent heavy drinkers were reported to more often likely to have behaviours that pose risk to themselves and others. Such behaviors included, riding with drinking drivers, driving when drank, never wearing safety belts, carrying guns and other weapons, becoming injured in fights, and suicide attempts (Hingson, et al., 2006). Further, results from a national survey in the United States show that respondents who begin drinking in their teenage years are more likely to experience alcohol related unintentional injuries (such as motor vehicle injuries, falls, burns, and drowning) than those who begin drinking at a later age (Hingson, et al., 2000).

Alcohol is a contributing factor in a substantial proportion of traffic crashes occurring in western Kenya. A need for policy response and specific interventions for discouraging driving under the influence of alcohol, including the establishment and enforcement of a legal BAC limit has been suggested (Odero, 1998).

## 2.2.6 Psychosocial Problems

Alcohol consumption is associated with widespread psycho social consequences. Such alcohol related psycho social harm is not confined to certain categories of populations or alcohol users. In the majority of the population in many countries, persons who occasionally drink are at high risk levels. While being individually responsible for less harm than heavy drinkers, they are collectively responsible (due to their greater number), for the largest share of alcohol burden on society (WHO, 2004(a)).

In terms of financial cost, the overall economic cost of drug abuse in the United States has risen at the rate of 5.3% annually from $107.5 billion in 1992 to an estimated $ 180.9 billion in 2002. Available data from the USA and Canada shows that consequences of alcohol abuse and dependence have both direct and indirect costs (WHO, 2004(b); Rehm, et al., 2006).
Direct costs are medical expenses for treatment of alcohol problems, law enforcement efforts to curb crime attributed to drug use, motor accident damage caused by drunken driving, fire damage and deaths because of impairment of sensory judgment or physical function and costs associated with providing employee support at work place. Indirect costs include lack of productivity in the workplace, home or school, illness and injury as a result of alcohol use and premature death (WHO, 2004(b)). In Tanzania, Whyte (1991) reported that financial loss was associated with alcohol use with families spending large sums of money in payment to traditional healers.

Psychosocial research on adolescent drinking has not identified specific sets of personality traits that uniquely predict alcohol use, but some traits have been shown to be associated with heavy alcohol use and alcohol use disorders. These traits include disinhibition or poor self-regulation, impulsiveness and aggression, novelty seeking, and negative affectivity. Externalizing behaviours in childhood and early adolescent have been found to predict alcohol use disorders in early adulthood, as have certain internalizing behaviours (Grant, et al., 1997).

Early drinking and alcoholism has also been linked to personality characteristics such as impulsivity, seeking out new experiences and sensations (Virkkunen, et al., 1997). Some evidence indicates that genetic factors may contribute to the relationship between early drinking and subsequent alcoholism (Kono, et al., 1997). Early drinking onset has been linked

to academic underachievement and antisocial personality (McGue, et al., 2001; Hingson, et al., 2006).

### 2.2.7 Co morbidity

Global current trend shows tendency to polysubstance use either together or at different times. This is likely to further increase the risks associated with alcohol dependence. Early drinking onset has been linked to nicotine dependence; illicit substance use and conduct disorder (McGue, et al., 2001). In addition emerging global trends shows that drug abuse is co morbid with certain psychological and social pathologies (Smart, et al., 1980; Boys, et al., 2001).

Significant positive correlation between major depressive illness, panic disorder, and alcohol abuse has been demonstrated in patients in Kenya by Ndetei et al. (2008) in a sample of 691 patients admitted in Mathari referral psychiatric hospital. He found co morbidity of substance abuse, major psychiatric disorders and anxiety disorders to be high. Substance abuse co morbid disorders may increase relapse after alcohol treatment. Depressed patients may use alcohol to achieve a sense of well being while co morbidity of panic disorder and alcohol may be a reflection of the use of alcohol to control panic attacks (Ndetei, et al., 2008). Depression may also reduce the resolve needed to refrain from alcohol, or alternatively depression may lead to self medication with alcohol (Hasin, et al., 2002, Khantzian, et al., 1990).

Nicotine and alcohol interact in the brain, each drug possibly affecting vulnerability to dependence on the other (Schiffman, et al., 1995). Consequently, some researchers postulate that treating both addictions simultaneously might be effective, even essential, way to help reduce dependence on both (Hurt, et al., 1994). Treatment of all co morbid disorders is necessary if remission from alcohol dependence is to be sustained.

### 2.2.8.0 Neuropsychiatry syndromes

Alcohol misuse and alcohol withdrawal is associated with a variety of neuropsychiatry syndromes. Vitamin B deficiency is known to contribute to the aetiology of a number of these syndromes and Vitamin B supplementation, thus plays a significant part in prophylaxis and treatment (Cook, et al., 1998). A few of the neuropsychiatric syndromes are discussed below.

### 2.2.8.1 Wernickes Encephalopathy and Korsakoff Syndrome

This is one of the most serious neuropsychiatric conditions associated with alcohol misuse and which causes significant morbidity and mortality (Victor, et al., 1989). The onset is commonly, but not always associated with alcohol withdrawal and may occur in patients who do not use alcohol (e.g. in those with gastric carcinoma).

The term Wernicke encephalopathy is used to describe the clinical triad of confusion, ataxia, and nystagmus (or ophthalmoplegia). When persistent learning and memory deficits are present, the symptom complex is often called Wernicke-Korsakoff syndrome. Clinically, this term is best conceptualized as 2 distinct syndromes with acute/sub acute confusion state and often reversible findings of Wernicke encephalopathy versus persistent and irreversible findings of Korsakoff dementia. Korsakoff's psychosis is characterized by short-term memory loss, but with preservation of other intellectual functions.

Health care providers usually need to treat varying degrees of withdrawal symptoms in any patient who presents with Wernicke-Korsakoff syndrome (Xiong, et al., 2008). Heavy long-term alcohol use is the most common etiology for development of Wernicke-Korsakoff syndrome. A deficiency of thiamine (vitamin B-1) is responsible for the symptom complex manifested in Wernicke-Korsakoff syndrome, and any condition resulting in a poor nutritional state places patients at risk. Alcohol interferes with active gastrointestinal transport, and chronic liver disease leads to decreased activation of thiamine pyrophosphate from thiamine, as well as a decreased capacity of the liver to store thiamine. The treatment is replacement of this essential vitamin (Day, et al., 2004). The mortality rate of wernickes encephalopathy is up to 10-15% in severe cases (Day, et al., 2004).

Two commonly held fallacies concerning Wernicke's encephalopathy are, that the condition is rare (Torvik, et al., 1982, Thomson, et al., 1992) and secondly that the triad of symptoms originally described by Wernicke in 1881 (Ophthalmoplegia, confusion and ataxia) are invariably present (Harper, et al., 1986). Use of parenteral thiamine has been known to be prophylactic especially when used during alcohol withdrawal.

### 2.2.8.2 Alcoholic Pellagra Encephalopathy

This condition is much rare than the Wernicke-Korsakoff syndrome, with a prevalence of 0.003% in one series of postmortem examinations (Hauw, et al., 1988). It was recognized in 1869 and is due to deficiency of niacin (and possibly other B vitamins). Alcoholic pellagra encephalopathy is characterized most likely by confusion, oppositional hypertonus and myoclonus (Serdaru, et al., 1988), cogwheel rigidity and grasping and sucking reflexes (Jollife, et al., 1940) hallucinations, insomnia and tremor, ataxia and urinary and fecal incontinence (Ishii, et al., 1981), in association with chronic alcohol misuse.

It responds readily to treatment with nicotinic acid and in one case report treatment with IV B complex vitamins led to the resolution of pellagra encephalopathy (Teare, et al., 1993).

### 2.2.8.3 Alcohol withdrawal Fits

Medical writings have linked alcohol and seizures since the times of Hippocrates. Although no causal relationship has been well established, there is some evidence that pyridoxine deficiency may increase the risk of alcohol withdrawal fits, (Bonjour et al., 1980). Patients with alcohol dependence pose a clinical dilemma both in terms of understanding and relationship of the two conditions (Devetag, et al., 1983). The aetiology of seizures in alcoholism is diverse and successive studies have shown decreasing conviction of such seizures as primary attributed to alcohol withdrawal (Earnest, et al., 1976; NG, et al., 1988; Hillbom, et al., 2003); Victor, et al., (1976), attributed 88% of the seizures to alcohol withdrawal, but subsequent studies have lower figures of 59% (Earnest, et al., 1976), 13% (Hillbom, et al., 1980), and 28%; (Murthy, et al., 2007; Hillbom, et al., 2003).

Withdrawal seizures (rum fits) occur within 6-48 hours of alcohol cessation and are characterized by motor seizures. Reportedly, 60% of patients have multiple seizures, 3% of patients develop status epilepticus, while about 30-40% of patients with alcohol withdrawal seizures progress to delirium tremens (Burns, et al., 2007).

### 2.2.8.4 Delirium tremens (DTs)

Delirium tremens is the most severe manifestation of alcohol withdrawal. It occurs 3-10 days following alcohol withdrawal. It is characterized by altered consciousness, hallucinations and disorientation, global confusion, agitation, tachycardia and hypertension. Commonly, these patients have co existing medical, surgical and psychiatric diagnosis. Benzodiazepines are considered to be the drugs of choice for the management of all stages of alcohol withdrawal to minimize withdrawal related problems (Hauw, et al., 2000).

## 2.3.0 Aetiology of alcohol dependence

Alcohol dependence is considered a multi factorial health disorder that often follows the course of a relapsing and remitting chronic disease (WHO, 2008). Unfortunately in many societies drug dependence is still not recognized as a health problem and many people suffering from it are stigmatized and have no access to treatment and rehabilitation. Over recent years, the bio psychosocial model has recognized drug dependence as a multifaceted problem requiring the expertise of many disciplines (WHO, 2008).

In the past decades, alcohol dependence has been considered, depending on the different beliefs or ideological points of view: only a social problem, only an educational or spiritual issue, only a guilty behaviour to be punished, or as only a pharmacological problem (WHO, 2008).

The stigma and discrimination associated with drug dependence emanates from the notion that drug dependence could be considered a 'self-acquired disease', based on individual free choice leading to the first experimentation with illicit drugs (WHO, 2008). However, scientific evidence indicates that the development of the disease is a result of a complex multi factorial interaction between repeated exposure to drugs, and biological and environmental factors. This explains why attempts to treat and prevent drug use through tough penal sanctions for drug users have failed mainly because such attempts do not take into account the neurological changes drug dependence has on motivation pathways in the brain (WHO, 2008).

Studies have implicated genetic factors (Goodwin, et al., 1973; Goodwin, et al., 1974; Goodwin, 1976; Schuckit, 1984; Theodore, et al., 1998; William, et al., 1999; Heath, et al.,

1997), behavioural factors (Kinney, et al., 1987) and biological factors (neurotransmitter) (Kono, et al., 1997) as important aetiological factors.

## 2.4.0 Description of Existing Types of management for alcohol dependence

### 2.4.1 Screening

Screening of alcohol dependent persons is an important aspect in the treatment of alcohol dependence. Primary care practitioners are in a unique position to identify patients with potential alcohol problems and intervene when appropriate. Delayed interventions in persons with alcohol related problems is due to the fact that many general practitioners have negative perceptions of dealing with people who have alcohol and other drug related problems (Chick, et al., 1994).

Reportedly physicians in various health care settings often do not recognize and treat alcoholism (Nigel, et al., 1997). These findings underscore the need for effective and accurate procedures that enables clinicians to screen for alcoholism. Unfortunately in Kenya and many of the African countries, screening for alcohol related problems is not routinely done and many general practitioners lack the skills of managing severe cases of alcohol dependence (Ndetei, et al., 2009). This leads to delay in management of alcohol related problems as they seek the few available specialists.

### 2.4.2.0 Treatment

The treatment of alcohol dependence mainly consists of psychological, social and pharmacotherapeutical interventions aiming at reduction of physical withdrawal craving and alcohol relapse (Keifer, et al., 2005). A study by Keifer et al.(2005) showed that alcohol dependence appears to involve adaptive changes in amino acid neurotransmitter systems, stimulation of dopamine and opiod peptide systems and changes in serotonegic activity (Keifer, et al., 2005). Consequently the best results in management of alcohol dependence involve a multidisciplinary approach with available comprehensive treatment for alcohol dependence having two main components, detoxification and rehabilitation.

### 2.4.2.1 Detoxification

Detoxification can be done on inpatient, day hospital and outpatient basis. The more intensive the treatment, the higher the abstinence rates (Monahan and Finney, 1996). The goal of detoxification is to rid the patient's body of the toxic effects of alcohol and to ameliorate the symptoms and signs of withdrawal. Detoxification lasts for some days, 2 or 3 weeks. Integrated inpatient detoxification includes a careful diagnostic process, medical treatment, and a psychotherapeutical treatment aiming at motivation for further treatment (Stetter, et al., 1995).

### 2.4.2.2 Alcohol Withdrawal Symptoms

During the detoxification period withdrawal will be differently present for different patients, depending on the severity of the alcoholism, as measured by the quantity of alcohol ingested daily and the length of time the patient has been dependent on alcohol. Withdrawal symptoms can range from mild to life threatening. Mild withdrawal symptoms include nausea, aches, diarrhoea, difficulty sleeping, perspiration, anxiety, and tremors. This phase is usually over in about three to five days. More severe effects of withdrawal can include hallucinations, seizures, strong craving, confusion, fever, palpitations, high blood pressure, and delirium. In 95% of cases withdrawal appears to be uncomplicated (Mayo-smith, et al., 2004), though for the severely dependent client use of medication is advisable to avoid life threatening withdrawal syndromes (Whitfield 1980).

Benzodiazepine has been found useful in detoxification though, these are only really required to prevent serious complications developing during withdrawal and not all patients require benzodiazepines (Northumberland, et al., 1994). Mayo-Smith (2004) and Bashai (1990) have confirmed effectiveness of use of benzodiazepines in management of alcohol withdrawal.

The treatment of alcohol withdrawal symptoms aims at helping the patient achieve detoxification in a manner that is safe and comfortable as possible and secondly enhances the patient's motivation for abstinence and recovery (Gallant, et al., 1999). Medical detoxification is only the first stage of addiction treatment and safely manages the withdrawal symptoms. Though medical detoxification by itself does little to change long term drug use, it helps

dependent persons achieve long term abstinence, and for some people it is a strongly indicated precursor to further treatment (NIDA, 1999).

### 2.4.2.3 Rehabilitation

Rehabilitation is meant to provide full or partial restoration of physical, psychological, or social function that has been damaged by a previous disease or condition (e.g. counseling for psychological problems). Principles of effective drug dependence treatment indicate that no single treatment is appropriate for every individual. Matching individual's particular problems and needs to a chosen treatment is crucial in achieving success (NIDA, 1999).

Counseling (individual and/or group) and other behavioural therapies are critical components of effective treatment for dependence. During therapy, patients should be helped to address issues of motivation, build skills to resist drug use, replace drug using activities with constructive and rewarding non drug using activities, and improve problem solving abilities (NIDA, 1999). During rehabilitation the affected individuals are helped to anticipate, understand, recognize, and prevent relapse.

Remaining in treatment for an adequate period of time is critical for treatment effectiveness. The appropriate duration for an individual depends on his or her problems and needs. Research indicates that for most patients, the threshold of significant improvement is reached at about 3 months in treatment. After this threshold is reached, additional treatment can produce further progress toward recovery (NIDA, 1999).

Almost all treatment programmes advocate total abstinence from alcohol. Rehabilitation may be institution based or community based. In Kenya alcohol dependent persons undergo institution based rehabilitation for 90 days which is almost exclusively based on the twelve steps of brief intervention. Community based rehabilitation of alcohol dependent persons has not been explored in Kenya. The multiple needs of the individual should be attended to for treatment to be effective (NIDA, 1999).

### 2.4.2.4 Pharmacological intervention during detoxification and rehabilitation

Pharmacological interventions in the management of alcohol dependent persons play a crucial role in the reduction of craving, drinking and maintenance of abstinence. Various pharmacological agents have been used during both detoxification and rehabilitation. Medications are an important element of treatment for many patients, especially when combined with counseling and other behavioral therapies (NIDA, 1999).

### 2.4.2.5 Vitamin B supplementation

Vitamin B deficiencies are common in alcohol misuse and dependence. It would be wise to provide prophylactic B vitamin supplementation for all patients who undergo alcohol withdrawal, especially highly dependent persons. Since there is a high prevalence of vitamin B deficiency in alcohol dependent patients, increased thiamine requirement associated with increased metabolic demands at alcohol withdrawal, and lack of rapid efficient laboratory tests for vitamin deficiency, (Cook, et al., 1998). Cook et al. recommends that the prophylactic dose be a minimum of one pair of ampoules of intramuscular or intravenous high potency vitamins B and C. This is given once daily for the first 3-5 days of inpatient alcohol detoxification.

Studies (Williams, et al., 1968, Majumdar, et al., 1980, Blign, et al., 1983) describe prophylactic regimens of one pair of ampoules of high potency parenteral B complex vitamins once or twice daily for 3-5 days in at risk alcoholics undergoing detoxification. These regimens were effective in preventing the development of the Wernicke's-Korsakoff Syndrome (Williams, et al., 1968, Majumdar, et al., 1980, Blign, et al., 1983).

Pabrinex is the Vitamin B and C available parenteral high potency drug. Pabrinex comes in either intravenous high potency (Blue carton) or intramuscularly high potency (Red carton). The intramuscular form is unavailable in Kenya (Linda, Phillips Pharmaceuticals 2007). Pabrinex is a stardard component of alcohol detoxification in Kenya. It is usually given intravenously once daily for 3-7 days depending on the level of alcohol dependence.

### 2.4.2.6 Benzodiazepines

The use of Benzodiazepines to control withdrawal symptoms takes advantage of cross-tolerance between alcohol and this class of medication (Ciraulo, et al., 1991). Evidence from studies (including several metanalysis), indicates that benzodiazepines are useful (Holbrook, A.M et al., 1999, Mayo-Smith, 1997, Ntais, et al., 2005) and effective in the treatment of alcohol withdrawal (Hauw, et al., 2000, Bashai, 1990).

Literature is however less clear about benzodiazepines or a specific protocol for detoxification with benzodiazepines. Chlordiazepoxide, diazepam oxazepam and lorazepam are commonly used (Naranjo, et al., 1983, Saitz, et al., 1994). In Kenya diazepam is the commonly used.

### 2.4.2.7 Anticonvulsants

The use of anticonvulsants as a treatment for acute alcohol withdrawal has been reported to be effective agent during period of detoxification in several studies (Malcolm, et al., 2002, Reoux, et al., 2001, Rosenthal, et al., 1998, Malcolm, 2000, Myrick, et al., 2000), in meta- analysis (Holbrook, et al, 1999, Mayo-Smith, 1997) and in review (Malcolm, R et al., 2001).

Anticonvulsants and Benzodiazepines appear to have comparable efficacy in preventing seizures during alcohol withdrawal. Doses of Carbamazepine 600-800mg a day for the first 48 hours, and then tapered by 200mg a day has been demonstrated to be effective in preventing withdrawal related seizures (Wilbur, et al., 1981, Pountanen, 1997, Malcolm, et al., 1989, Chu, 1979, Post, et al., 1983).

### 2.4.2.8 Other pharmacological agents

A review of pharmacological interventions by Castrol, et al., (2004), shows that the opiod natrexone lowers relapse rate, reduces drinking days and prolongs periods of abstinence, while acomprosate restores the normal activity of glutamate and Gamma Amino Butyric acid systems (Castrol, et al., 2004).

Disulfuram has shown to be more effective for patients who believe in its efficacy and remain compliant with treatment. Another drug that has shown promise is ondansetron especially in early onset alcohol dependence though it needs more extensive study (Castrol, et al, 2004). Another drug topiramate has been found to be more efficacious than placebo in the treatment of alcohol dependence (Castro, et al., 2004).

Though studies on use of out patient medications for outpatient detoxification are few, a study done in Germany to determine the efficacy and safety of outpatient alcohol detoxification with a combination of triapride and Carbamazepine found the combination effective and safe in treatment for outpatient alcohol detoxification in patients with moderate severity of withdrawal syndrome (Soyka, et al., 2005) with similar finding by the same authors in another study (Soyka, et al., 2006).

### 2.4.2.9 Psychosocial intervention

Various psychological interventions have been tried in treatment of alcohol dependence. The efficacy of brief motivational interventions and the effectiveness of brief interventions in reducing alcohol consumption in primary care population in the U.K have been demonstrated (Wallace, et al., 1988). Though motivational enhancement therapy involves a relatively short sessions delivered by a trained therapist, primary research has shown it to be as effective as other more intensive interventions such as cognitive behaviour therapy, twelve steps facilitation therapy and social behavioural network therapy (Project Match, 1997; UKATT Research Team, 2005).

A potentially resource efficient means of meeting the needs of the alcohol dependent persons can be obtained from stepped up interventions in which more intensive interventions are only given to those who fail to respond to less intensive intervention (Coulton, et al., 2008). Stepped care interventions involve a brief opportunistic intervention followed by successively more intensive interventions for those who fail to respond to treatment (Coulton, et al., 2008).

### 2.4.2.10 Cost of treatment

Taking into account the requirements for the delivery of evidence based treatment, its costs are much lower than the indirect costs caused by untreated drug dependence (prisons, unemployment, law enforcement, health consequences) (WHO, 2008).

Research studies indicate that spending on treatment produces savings by reducing the number of crime victims and expenditures related to criminal justice system. A minimum of 3:1 saving and a maximum of 13:1 saving (when a broader calculation of costs associated with crime, health and social productivity was taken into account) were reported by the WHO, (2008). These savings can improvement of education, employment and social welfare and increase possibilities for families to recover battered economies, resulting to social and economic development (WHO, 2008).

In treatment of alcohol dependence, it is important to consider three factors, namely, the type, effectiveness and cost of treatment. Cost effectiveness is a useful approach that provides the most efficient allocation of resources. Such a choice could double the life years saved (Tengs, 1997; Tengs, et al., 1995). Currently in Kenya, cost effectiveness of available and unavailable alcohol treatments have not been studied.

### 2.4.2.11 Disparities in treatment

Available alcohol treatment services and programmes around the world are gender biased and have been developed to meet the needs of adult men. In most cultures women with drug problems are heavily stigmatized. As a result, access of women to treatment can be significantly limited. In addition, women tend to have specific needs of their psychological status and psychiatric co morbidity. Continued drug use affects their sexual and reproductive health. It is necessary to develop gender responsive services that fulfill women needs. Aspects such as, their design and delivery, locations, staffing, programme development, child friendliness and content and materials of the service should be considered (WHO, 2008).

Alcohol treatment interventions should address the needs of specific groups. An example of such groups is the drug dependent individuals involved in commercial sex as a means to afford the purchase of drugs. These individuals are exposed to increased risk of infections,

victimization, violence and social exclusion and offering a comprehensive package of measures to prevent HIV and hepatitis infection, and other sexually transmitted diseases would be more essential (WHO, 2008) than just treating the alcohol dependence alone.

Sources of sustainable livelihood can be offered through social support and rehabilitation programmes (WHO, 2008) to enable the patient to achieve a sustained remission after treatment. Many of low and middle-income countries including Kenya are however, not able to provide such services due to the scarcity of resources.

### 2.4.2.12 Role of self help groups and other treatments in the management of alcohol dependence

The role of self help support groups is to complement formal treatment options and supports standardized psycho social interventions (WHO, 2008) and are the most commonly sought source of help for alcohol related problems (Humphreys, et al., 1999).

Alcohol Anonymous (AA) is one of the commonly known groups in most countries. Alcohol dependent persons can become involved with AA before entering professional treatment, as a part of it or as after care following professional treatment. Although AA appears to produce positive outcomes in many of its members, (Emrick, et al., 1993, Humphreys, et al., 1997), its efficacy has rarely been assessed in randomized clinical trials (Longabaugh, et al., 1998) but theory of social support posits that abstinence specific support promotes abstinence, whereas general support only promotes psychological functioning (Longabaugh, et al., 1993). The few studies done indicates that the replacement of participants social network of drinking friends with a fellowship of AA members is of benefit, in that it provides the much need motivation and support for maintaining abstinence(Humphreys, et al.,1999). In addition, AA's approach emphasis on spirituality, social support, and its progressive 12-steps (Groh, et al., 2008), such skills is similar to those taught in more structured psychosocial treatment resulting to reduction in alcohol consumption.

It is important to note that almost any kind of available treatment helps the alcohol dependent persons. The clinician should consider use of low cost treatment, brief but frequent contacts with patients rather than intensive but short-term contacts. However, many of the alcohol

dependent persons require for long-term treatment and the clinicians should be prepared for relapses over a lifetime.

## 2.5.0 Evaluation of Available Treatment Services, Rates of Remission and Relapse after Alcohol Treatment

Psycho social treatments play an important role in both reduction of alcohol consumption and maintenance of abstinence in many patients though 40-70% of patients relapse one year after treatment (Swift, 1999).

The rate of remission depends on the severity of the alcohol use disorder and criteria for remission. Five percent to 45% of untreated individuals with alcohol use disorders might achieve some improvement or remission (Armor, et al., 1983; Roizen, et al., 1978). Other studies have higher estimate of untreated remission rates to range of 50% to 80% or more. Among treated individuals short-term remission rates vary between 20 and 50%, (Miller, et al., 2001; Monahan, et al., 1996). However, many of reported studies focused primarily on general population or media recruited samples. Such individuals are purposively recruited in the studies by the researchers may not be seeking for help and may have less and unrecognized problems (Blomqvist, et al., 1996; Cunningham, et al., 1999).

In comparing short-term abstinence in untreated and treated individuals, Moyer, et al.,(2002) in a meta-analysis of alcoholism treatment outcome studies, found average rates of 21% for untreated individuals in waiting list, no treatment or placebo conditions, compared to 43% for treated individuals (Moyer, et al., 2002).

Among untreated women, Moos, et al., (1992) found 62% remission rate in the helped sample which is comparable to the 57% that Haver, et al., 2001 found among initially untreated women with alcohol use disorders, but is somewhat higher than the 20–50% rate shown typically in treated samples (Miller, et al., 2001; Monahan, et al., 1996). Other consistent finding in treated samples reports a relapse rate of just over 40% for individuals who had obtained help and initially remitted (Finney, et al., 1999; Jin, et al., 1998).

Individuals who remitted without help were more likely to relapse than those who remitted after obtaining help, at a the relapse rate 60% which is higher than the 50% rate identified in 7- and 14-year follow-ups of untreated remitted individuals with alcohol use disorders (Klingemann, et al., 2004). Weisner, et al., (2003) found that treated alcohol dependent individuals had higher 1-year non-problem use outcomes than did untreated individuals (40% versus 23%).

Better short-term outcomes in treated individuals are associated with, women and older, married and better educated individuals (Jarvis, et al., 1992; McLellan, et al., 1994; Ornstein, 1985). In untreated individuals with active alcohol use disorders, better short term outcomes are likely to be older, women, married, employed and those with a later onset of alcohol problems (Bischof, et al. 2001; Booth, et al., 2004; Tucker, et al., 1994). Other studies confirm that there is better short-term outcomes with female gender and older age, and with more personal and social resources such as married status, education and self efficacy, less severe and chronic alcohol related involvement and less reliance on avoidance coping. These findings are consistent with previous work on both treated and untreated samples, and indicate that individuals with more 'social capital' are likely to show better short-term alcohol related outcomes (Armor, et al., 1983; McClellan, et al., 1994; Booth, et al., 2004; Granfield, et al., 2001).

Among both treated and untreated individuals, there is a lower likelihood of remission in those presenting with frequent and heavier alcohol consumption, more psychological and social drinking problems (Armor et al., 1983, McLellan, et al., 1994, Booth, et al 2004). Other factors include, more social resources, especially supportive relationships with family members and friends, (Bischof, et al., 2001; Gordon, et al., 1991; Tucker, et al., 1995), more reliance on approach coping and less on avoidance coping (Chung, et al., 2001; Moggi, et al., 1999; Moser, et al., 1996).

In general, among individuals who recognize their alcohol problems, treated individuals achieve higher remission rates than do untreated individuals, with an estimated long-term relapse rate of 20 to 80% in treated samples, (Finney, et al., 1999; Jin, et al., 1998).

## 2.6.0 Predictors of Short-term Remission

Knowledge of predictors of remission after treatment for alcohol dependence enables the clinician to offer better individualized treatment as per the needs of the person. Various factors have been linked to lower likelihood of short term remission in a number of studies. This includes more social pressure to abstain social pressure for change (Bischof, et al., 2001; Russell, et al., 2001), more severe alcohol related problems and depressive symptoms, lack of self efficacy and poor coping skills (Brown, et al., 1995; Connors, et al 1996; Miller, et al., 1996; Yates, et al., 1993). In general, these predictors are consistent with findings by Marlatt, et al., (1985).

Similarly, other studies of treated and untreated individuals have associated relapse to, fewer personal resources, such as lack of self efficacy and coping skills (Rychtarik, et al., 1992, Brown, et al., 1995, Connors, et al., 1996, Miller, et al., 1996). These studies support the concept that relapse is more likely to occur when personal and social resources that reflect maintenance factors for stable remission are lacking (Blomqvist, et al., 1999, Tuchfeld, et al., 1981, Tucker, et al., 2002).

Compared to continuously remitted individuals, four key risk factors characterized initially remitted individuals who later relapsed: less education, a lower likelihood of employed status, more life-time drinking problems and more frequent consumption of alcohol when remitted.

The above factors associated with relapse should be used by clinicians to assess a risk factor score enabling early detection of relapse potential after remission and initiation of appropriate preventive or more intensive intervention. Study has reported that individuals who relapsed consider their alcohol drinking as an insignificant problem, and relied more on alcohol drinking as a coping mechanism to tension. They also reported less self efficacy. Interestingly individuals who have experienced more drinking problems and tried previously to reduce their drinking without success have been found to be more motivated and ready to learn coping skills imparted in treatment and in AA increasing the chances of remission(Moos, R. et al., 2006).

The role of low self efficacy and lack of effective coping skills as risk factors for relapse should be considered during alcohol dependence treatment.

## 2.7.0 Inpatient, Outpatient and Day Care Approach to Alcohol Treatment

Detoxification has traditionally been done on inpatient setting but in the last twenty years there has been an increasingly desire to detoxify alcohol dependence persons at home or on outpatient basis. These results to cost reduction and also improves effectiveness (Nigel, et al., 1997).

There are 3 main modes of treatment, inpatient, outpatient and day hospitals. Inpatient treatment requires that a patient be admitted, in day hospital the person receives intensive care for about six hours daily while in outpatient treatment patients meet for two to eight hours per week. In Kenya treatment of alcohol dependent persons is almost exclusively inpatient.

The efficacy of inpatient treatment programmes has been evaluated by a number of studies and proven to be sufficient. There is however, the current trend of increased costs in public health facilities, raising the need for alternative cost- effective strategies. Further, there is growing evidence that outpatient treatment is safe and efficient therapeutic approach at least for some subgroups of alcohol dependents (Allan, et al., 1991). Though the numbers of studies on outpatient detoxification are few (Nigel, et al., 1997), they give evidence of effectiveness of outpatient treatment for alcohol dependent patients (Bottlender M, and Soyka M., (2005); Krampe, et al., (2006); Soyka and Schmidt, (2009).

Outcome of outpatient detoxification treatment of alcohol dependent patients is currently considered effective and many patients have opted to outpatient detoxification with or without professional supervision. Some studies describe outpatient alcohol detoxification as a safe and cost reducing method with some Scandinavian countries and USA, using outpatient detoxification under medical increasingly (Scherle, et al., 2003).

The purpose of outpatient detoxification is to control both the medical and psychological complications, which may occur temporarily after a period of heavy and sustained alcohol use (Nigel, et al., 1997). For a long time, the standard treatments for alcoholics for example in Germany consisted of a six-month inpatient treatment period and only recently have shorter treatment modalities and outpatient treatment been considered (Mann, et al., 1993).

Differences between day hospital and outpatient treatment are minimal (Project Match, 1997) with persons with low psychiatric morbidity having longer duration of abstinence as compared with those with severe psychiatric morbidity. It is therefore necessary to assess the level of psychiatric co morbidity before assigning clients to outpatient treatment (Project Match, 1997).

Studies indicate that outpatient care is now the predominantly preferred treatment setting (Schimidt, and Weisner 1993) with inpatient and outpatient treatments having comparable effectiveness despite the cost differences (Finney and Monahan, 1996, Mclella, et al., 1997). In a study in UK, 28 alcohol dependent persons were assessed 2 months after outpatient detoxification. Nine patients of these subjects had improved and the cost calculation indicted that inpatient detoxification six times more expensive than outpatient detoxification, demonstrating the cost-effectiveness of outpatient treatment of alcohol dependent patients. (Kujimana, et al., 1995).

Similarly, Allan, et al., (1991) in uncontrolled study compared the outcome of the safety; efficacy and acceptability of home detoxification and day hospital detoxification. Participants of both the home and day hospital group were given chlordiazepoxide 30 to 100mg in a day depending on the patients' needs and tailed off over a 7-10day period. Follow up of the home detoxification group was done daily by a community psychiatric nurse at home, while the hospital day group was seen daily by general practitioners in the clinic. Seventy nine percent (79%) of home detoxification patients were successfully detoxified at 10 days while 78% of the day hospital group completed detoxification. Significant improvement in alcohol related difficulties was recorded at 60 days, with 45% of home detoxification patients and 31% of the day hospital group showing significant improvements. Despite the limitation in the number of subjects enrolled in the study, (65) it confirms the safety and effectiveness of both home and day detoxification treatments (Allan, et al., 1991).

In another study done in UK, 173 patients were subjected to outpatient alcohol detoxification in a psychiatric emergencies clinic. Sixty percent of these successfully completed detoxification with no medical complications. The number of inpatients admission for detoxification to the local hospital was noted to decrease as compared with previous years. The authors confirm the safety and effectiveness of outpatient detoxification and suggest that this may make hospital admission unnecessary for many freeing psychiatric beds for other users (Collins, et al., 1990).

Similar findings in Germany have shown that an outpatient treatment programme is as effectiveness as inpatient or combined inpatient/outpatient treatment at least for some patients with good social integration. In this study, 97 patients were followed up for 6 months, 71 for 18 months and 33 for 36 months. Six months after outpatient treatment 59% were abstinent, 4% had lapsed and 37% were relapses (Mundle et al., 2001).

In another 1-year prospective study done in the same country, (among 331 alcohol dependence persons) outpatient detoxification was found to be safe and efficient therapeutic approach at least in a highly structured frame (Soyka, et al., 2006).

Soyka et al. (2004), in a prospective study done in Germany to examine the practicability and implementation efficacy of an alcohol outpatient detoxification mode and the concomitant 'motivational' psychotherapeutic approach concludes that outpatient detoxification is a safe efficient treatment approach, especially in 'a highly structured frame', (Soyka, et al., 2004).

Stetter et al., (1995), in German study involving 529 alcoholics undergoing detoxification, showed that outpatient detoxification and motivational therapy produces a positive behavior change enhancing the probability of further abstinence (Stetter, et al., 1995).

The majority of alcohol dependent person's do not come into contact with specialist treatment, leading to the recognition of the importance of developing primary level based interventions (Riston, 1992) with general practitioners having an important role in home detoxification (Stockwell, et al., 1986). Supervision of home detoxification that is nurse led process has been reported to be favourable (Stockwell, et al., 1991).

Although studies have shown that the severely dependent alcohol drinkers can undergo home detoxification (Stockwell, et al., 1991) or on outpatient basis (Collins, et al., 1990), they are reported to be unsuitable for home detoxification or outpatient treatment (Web, et al., 1991). Contraindications to home detoxification include the possibility of developing poor physical or mental health, convulsions, or delirium tremens (Stockwell, et al., 1987).

It is mandatory to obtain an informed consent from client and from the next of kin where possible before detoxification process. Consent explanation includes informing client on of all aspects of detoxification procedure, side effects, medication to be used and its dosage (Copper,

1995).Opinion as to who should keep medication varies with some studies suggesting that nurses should keep the medication (Stockwell, et al., 1987), others suggest the supporter (Copper, et al., 1995) while others suggest that if client holds medication to encourage a positive therapeutic process (Bennie, 1992).

It is felt that as a general rule for clients undergoing detoxification at home, medication is not required for Men and women who consume less than 16 units and 12 units a day respectively, generally do not require medication when undergoing home detoxification (Stetter, et al., 1995).

## 2.8.0 Treatment services available in Kenya

The cost of alcohol detoxification and rehabilitation differs in various countries, depending on the investigations done, type of medication given, the setting of treatment, the type of specialists involved and whether it is institution or community based.

In Kenya, only institution based detoxification and rehabilitation is practiced in treating patients with alcohol dependence. The alcohol dependent person is admitted to a private hospital for seven to twenty days under the care of a specialist (mainly a psychiatrist). Many of the persons admitted for detoxification are severely dependent on alcohol and pharmacological substances are commonly used during the detoxification, because many of those that come for treatment have heavy alcohol dependence. Pabrinex 1 & 11, a vitamin B and C combination is given intravenously for 3 to 7 days. Diazepam and Carbamezapine are also given to ameliorate the withdrawal symptoms. The person is then referred after a period of 7 to 20 days (depending on the level of dependence) to a rehabilitation centre. The cost of detoxification depends on the period of hospital stay, the quality and cost of drugs used the cost of hospital, doctor and investigations.

Rehabilitation begins immediately after detoxification. There are 63 rehabilitation centres in Kenya (NACADA, 2008). Only one of the rehabilitation is public, while the rest are private or mission based. Most rehabilitation centres have a low bed capacity of less than 100 persons. Patient stay in the rehabilitation centres for 90 days. The choice of the rehabilitation depends on cost, availability of space and quality of facilities. The cost of rehabilitation at the only

public rehabilitation centre in the country is Kshs 36, 000(514USD) for a 3 months inpatient stay in the rehabilitation centre while the cost of private rehabilitation centres varies from one to the other but much higher than the public rehabilitation centres.

Scientific evaluation of the cost and effectiveness of the institution based treatment for alcohol dependent persons has not been documented in Kenya.

## 2.9.0 WHO recommendations to drug dependence treatment

### 2.9.1 Community based health care services in treatment of drug dependence

Illicit drugs are used by an estimated 205 million people in the world, with 25 million suffering from illicit drug dependence. For both the industrialized and developing countries this results to public health, socio economic development and security problem. Prevention of drug dependence its treatment and demand reduction have been recommended by the WHO to improve public health (WHO, 2008). The World Health Organization encourages use of evidence based interventions in dealing with drug dependence (WHO, 2008). The magnitude of the drug problem and the lack of adequate resources dictate that proper treatment plan is instituted. Development of treatment interventions of low cost that can reach the maximum number of people has been recommended in order to provide sustained health care services at the community level. Involving primary health care workers provides routine screening opportunities for general lifestyle including drug use (WHO, 2008).

According to WHO (2008) guidelines on the principles of drug dependence treatment, various factors should be considered when planning for management of drug dependence. Some of these factors are discussed later.

Availability of low threshold services is important with flexibility in the organization of treatment services improving access by more people in need. Patients that require admission should easily receive admission without stringent selection.

Affordability of services is essential. Cost of treatment and rehabilitation services may constitute a significant barrier for persons who in many have no income. Insurance coverage or inclusion of drug dependence care in the public health care system is therefore key to promote access for those most in need. Few people have insurance cover in Kenya and most insurance do not cover drug dependence treatment. In addition alcohol dependence treatment is not included in public health care system.

Cultural relevance and user friendliness is necessary too. Current knowledge indicates that a treatment climate that is culturally sensitive, preferably multi professional, and team orientated, that encourages patient participation and involvement in treatment, facilitates patient access and retention in treatment, and ultimately improved treatment outcomes.

Patients affected by drug use disorders often have multiple treatment needs. These include personal, social and economic needs which make it necessary to employ a holistic approach in management. Personalized and effective treatment plan requires proper diagnosis, and thorough assessment of other medical problems.

Training should be done on primary health care staff, employee assistance programmes and health/counseling staff in social services, both in schools and criminal justice system to enlighten them on benefits of screening and how to administer screening tools, early identification of drug use and brief interventions.

Drug dependence interventions should be research based with standards maintained as is common in interventions in all the other medical disciplines.

There exists a wide range of evidence based pharmacological and psycho social interventions that can be used in different stages of management process. Treatment should be specific to each patient and intended to address the diagnosed syndrome having in mind that no single treatment is appropriate for all patients. While moderate cases may be treated at primary level setup, patients with heavy alcohol dependence and co morbidities may require a more intensive intervention.

Sufficient duration of treatment is recommended especially for management of complex chronic diseases and preventing relapse to drug dependence. It is therefore important for treatment services to develop approaches to facilitate long-term patient retention in treatment.

The integration of psycho social and pharmacological treatment methods can improve the outcome and should be proposed to improve results in terms of relapse prevention.

Multidisciplinary teams including medical doctors, psychiatrists, psychologists, social workers, counsellors and nurses can respond best to needs of patients, also due to the multi-factorial nature of drug dependence. Treatment and care for physical conditions and co morbid psychiatric disorders utilizing both medications and psychosocial interventions may significantly improve the outcomes of drug treatment.

Medically supervised withdrawal is required for patients who are heavy dependent users of certain substances (such as opioids, sedative/hypnotic substances, and alcohol) and are likely to experience withdrawal complications. Detoxification prepares the person for long lasting drug free oriented programmes.

In both outpatient and inpatient settings, psychological and social interventions are reported to be effective in rehabilitation and relapse prevention. Psychotherapies such as cognitive behavioural therapy, motivational interviewing and contingency management, have shown promising results. Social inclusion may be facilitated by providing social support interventions including, offering job opportunities, vocational training and legal advice and support.

### 2.9.2 Components of community based treatment (WHO, 2008)

A community based response to drug use and dependence has the ability to support and encourage community behavioural changes especially if the service delivery employs a cooperative rather than a directive approach to service delivery. Cooperative form of service delivery, involves active involvement of local stakeholders (governmental and non governmental organizations, private sector, community leaders, religious organizations, and traditional healers), community members (families) and the targeted populations. These helps to establish ownership and an integrated network of community based health care services.

Components of community based treatment includes patients' active involvement, accountability to the community, community oriented interventions and mainstreaming. Patient active involvement aims at promoting ownership and responsibility, changing individual behaviour, and improving of the quality and utilization of health services. Benefits of community services includes promotion of a close therapist-patient interpersonal relationship, a therapeutic alliance which enables sharing of the goals and methods of the programme in advance and periodically collecting patient feedback on services provided.

Accountability to the community is important and increasing recognition of the fact development treatment services that requires being both accountable and shaped to meet the community interests. Involvement of service users is necessary in helping shape services that are accountable in addition to assigning responsibility of all those involved in the delivery of services. Involvement of families of the patients in the therapeutic process is necessary, relevant, and provides support for family members.

Community oriented interventions can increase community support to people with drug problems and promote supportive public opinions and health policy. Health education to the community empowers the people and can help in reduction discrimination and social marginalization of drug dependent persons with consequent improvement in accessibility to treatment and reintegration into society. Target populations, their families, community members and local organizations are actively involved in the planning, implementation and monitoring of drug dependence treatment services. These involvement leads to improvement in the community drug problems and contribute to changing the public perception of drug dependence towards a chronic complex disease model.

Mainstreaming drug dependence treatment in health and social care interventions not only enables the treatment of a larger number of patients, it also promotes a paradigm change within society to acknowledge drug dependence as a multi-factorial disorder. Primary health, mental health, and social care service staff are trained in and conduct screening for drug use and drug use disorders, and deliver brief interventions.

In community based treatment, it is important to establish links between drug dependence treatment services and other hospital services in order to offer a holistic approach to management. Integrating psychiatric and drug dependence treatment increases retention of

patients with co morbid psychiatric disorders and reduces mortality. In ideal situations drug treatment services should be integrated within the public health and social care networks, and linkages established with all relevant partners in the community.

NGOs can play a significant role in the provision of services for patients with drug dependence in coordination with the public health system. They can be particularly helpful in the process of scaling up treatment and facilitation of rehabilitation and reintegration. Governmental and non governmental organizations collaborate and are involved in establishing an integrated treatment network in the community. A sound and long-term educational and awareness strategy aimed at the general public should be implemented to disseminate the concept of addiction as a disease and promote the value of evidence-based treatment.

## 2.10.0 Cost effectiveness analysis and alcohol treatments.

### 2.10.1 Cost effectiveness and use of resources

Efficiency of spending public and private resources in improving health is necessary for all countries irrespective of whether they are wealthy or poor considering that there are many competing priorities for the same resources (Laxminarryan, et al., 2006).

Cost effectiveness analysis (CEA) method selects among competing needs when resources are limited (Primer on cost-effectiveness analysis, 2009). In evaluation of health economics the method compares at least two alternatives outcomes and expresses it in a common unit, such as cost per life years saved (Brockhuis, et al., 2002).

Cost effectiveness analysis was first applied to health care in the mid-1960s, and is devised to optimize allocation of resources to programmes competing for the same limited resources. In general it is used in medical technologies, procedures, or clinical strategies it helps to evaluate the relative costs and benefits of different interventions (Gazelle, et al., 2005).

Cost effectiveness in a health intervention is the quantifiable, significant results obtained from the intervention (Jamison, et al., 1993) and a low ratio of cost to effectiveness indicates a cost effective health intervention as measured in natural units (deaths averted and years of life saved) and in DALYs (Laxminarayan, et al., 2006). Alternatively cost effective ratio data can

be utilized in making choices of health intervention setups, when interpreted as the price of 'equivalent units of health using different interventions' (Laxminarayan, et al., 2006).

### 2.10.2 Role and Benefits of CEA

The role cost effectiveness research is to choose methods that are efficient in identifying neglected opportunities. It highlights relatively inexpensive interventions which have the potential to greatly reduce the burden of disease as well redirecting resources to produce significant results (Jamison, et al., 1993).

Cost effectiveness analysis emphasizes the need to allocate resources to cost-effective interventions and direct resources from less to more cost-effective interventions (Jamison, et al., 1993). The approach of CEA is useful in efficiently allocating resources and could double life years saved (Tengs, 1997; Tengs, et al., 1995).

Cost- effective analysis was first advocated as a useful tool of guiding public health policies in the developing nations by the 1993 edition of Disease Control Priorities in Developing countries (Jamison, et al., 1993).Comparing the effectiveness of an intervention to its cost enables developing countries to utilize unutilized opportunities to improve health and achieve better health outcomes. The publication presented cost effectiveness analysis as an important tool for identifying these neglected opportunities and directing resources to better use (Jamison, et al., 1993).

Cost effectiveness information brings awareness to policy makers of differences in the cost of improving health using different interventions. Using interventions with a high price should be avoided or be used less where as use of low cost interventions should be used to a greater extent when all other factors considered are equal (Laxminarayan, et al., 2006).

Although efficiency in spending health care resources can positive change on the health of their populations, saving lives will depend on the commitment of policy makers (Laxminarayan, et al., 2006).

### 2.10.3 Method of Cost Effective Analysis

The method of cost- effective analysis compares a new clinical intervention with the most commonly used intervention at the time (Chisin, (2009)). In the current study for instance, the community based detoxification and rehabilitation of alcohol dependent persons which has not been implemented in Kenya is compared with the traditionally practiced institution based detoxification and rehabilitation of alcohol dependent persons.

### 2.10.4 Measure of cost and effectiveness

CEA aims at comparing two strategies in terms of the 'cost' of added beneficial outcome, in other words, is the health benefit (effectiveness) increment worth the addition cost obtained.) The benefits are usually measured in terms of life expectancy or survival rates, such as the number of life years saved. Therefore CEA deals with costs and benefits increment. 'The incremental cost-effectiveness ratio is the ratio of marginal cost to marginal effectiveness' and is expressed as cost per life years saved by use of new intervention (Chisin , 2009).

Evaluation of the economic aspects of an intervention should include both direct and indirect costs incurred during the intervention as compared to the personal and societal benefits obtained from the intervention. This comparison includes cost-benefit evaluation, which involves comparing the cost and benefits of the intervention with those of no intervention at all (Laximnarayan, et al., 2006).

Cost effectiveness analysis method relates the financial with the scientific implications of an intervention and is therefore useful in evaluating the health benefits relative to the costs of different interventions. Basically the cost of an intervention in monetary units is divided by the expected health gain measured in natural units such as number of lives saved. Some studies calculate cost effectiveness using years of life lost as natural unit for measuring the effect of interventions (Laxminarayan, et al., 2006).

Interventions with lower cost effectiveness ratios are thought to be more cost effective than those with higher ratios (Gazelle, et al., 2005). Cost effective analysis calculation is however not always simple. Complications revolve around a number of factors. Firstly, it is not simple to measure effectiveness since it is based on measuring quality of life which is sometimes

difficult to estimate (Atherly, et al., 2000). Another difficulty is in the determination of what cost should be considered cost effective. This requires a value judgment which is not always easy to make. Mohan and Miles, (2009) adopted a threshold cost of, at most, £30,000 (US$42,900) per life years saved, above which an intervention was not considered as cost effective (Mohan et al., 2009). The World Bank on the other hand considers health interventions costing less than US$100 per year of life saved as been highly cost effective for poor countries (Jamison, et al., 1993).

### 2.10.5 Source of data for Cost Effective Analysis

In ideal situations the source of data for cost effective analysis should be obtained from randomized trials. These are however expensive and time consuming (Chisin , 2009) and many of these clinical studies do follow up patients for a long time after medical intervention nor collect little or no economic data (Brockhuis , et al., 2002). Enriching the data can be done by extending the economic analysis beyond the observed by use of modeling technique for example, by extrapolating clinical outcomes such as survival (Brockhuis , et al., 2002) or by using a combination of data from different sources.

Despite these apparent contradictions, proper prospective clinical trials are important and cost effectiveness assessment be derived from clinical studies whenever possible (Mohan, et al., 2009; Gambhir, et al., 1996; Dietlein, et al., 2000; Hernández, et al., 2007).

In CEA it is important to indicate whether the data is from modelling, or from actual measurement (Primer on cost-effectiveness analysis, 2009). In modeling, the cost is derived by making assumptions about the interventions utilization and cost while prospective clinical trials have the advantage of obtaining un anticipated data (e.g., extra testing, extra visits, and readmissions) (Primer on cost-effectiveness analysis, 2009).

## 2.10.6 Inter regional variations and other variables in Cost Effective Analysis

The costs and efficacy of interventions may vary from society to society, even within a single geographical region and the needs of a society may be unique. Among factors that may contribute to differences in CEA includes, local health system capacity, cultural context, and disease epidemiology. Allocation of resources to specific health interventions is influenced by the medical, political, ethical and cultural factors (Laxminarayan, et al., 2006).

The scope of direct variable costs provides a service; which includes the cost of additional materials and staff. It excludes the costs associated with the use of existing infrastructure of installed capacity by apportioning some share of the fixed costs of facilities and administration to the costs of the service. Other cost includes the time patients and family members spend in obtaining a service or the cost of transportation to reach facilities (Laxminarayan, et al., 2006).

The analysis assume uniform international costs of all low and middle income countries (LMICs), usually adjusted for local transportation and distribution costs. By using a single composite set of resource costs for each region, analysis mask intraregional differences in the costs of non-tradable goods such as physician time or hospitals. This methodology is appropriate because results are presented only at the level of region (Laximinarayan, et al., 2006).

The interregional differences in cost effectiveness of an intervention are even more pronounced because of variations in mortality, sex, age structure, disease prevention and efficiency with which interventions are implemented. Ranges for cost-effectiveness rations are also attributed to variations in epidemiological setting in which these interventions are evaluated. For example, a population based primary intervention in an area of low prevalence is likely to be less cost-effective than the same intervention in a region of high prevalence (Laximinarayan, et al., 2006).

All cost effectiveness analysis should take into account interregional cost differences that are attributed to differences in the local cost of goods and services that are tradable, such as patented drugs and specialized medical equipment typically improved for industrial nations (Laximinarayan, et al., 2006).

### 2.10.7 Cost effective interventions in alcohol treatment

A number of studies have shown that outpatient detoxification is more cost effective than in patient detoxification (Hayashida, et al., 1989; Berg and Dubin, 1990). Among the interventions that have been found to be cost effective in dealing with alcohol abuse are, 25-50% increase in excise tax rate, brief advice by primary care doctor, and excise tax, advertising ban with brief advise combined (Laximinarayan, et al., 2006).

In planning for an alcohol abuse cost effective intervention, it is important to consider the infrastructure as fixed, at least in the immediate future, and then determine how it can best be used to deliver the most cost effective intervention (Laxminarayan, et al. 2006).

An important determinant of cost effectiveness is the quality of the intervention since it results to efficiency in use of resources. There is a relationship between community health status and the quality of health service facilities. The greatest potential for improving quality of health at a low cost is in resource deprived societies. 'Population based interventions are cost effective when effectively targeted to populations in which diseases prevalence is high or the potential prevalence and subsequent mortality if the interventions are not implemented '(Laximinarayan, et al., 2006).

In the current study targeting the alcohol dependent persons in the informal settlement where alcohol abuse and dependence is prevalent would provide great impact.

### 2.10.8 Limitations of cost effective analysis

In spite of the importance of CEAs it has limitations, such as uncertainties in both economic and medical evaluations. Critical readers of CEA's should also carefully consider generalizing the efficacy data, such as the medical results of a certain surgical procedure performed in experienced centres versus broad implementation of the strategy by community providers (Primer on cost-effectiveness analysis 2009).

Validity of effectiveness data, which ideally should come from randomized controlled clinical trials, should also be considered though they have the disadvantage of high cost in terms of time and money (Chisin, 2009). In addition, comparing interventions according to cost-

effectiveness criteria must be done with a clear understanding that comparison of the interventions only on their efficiency at improving health. Non health benefits can only be considered if it is done for all interventions under evaluation and not a selected few. These involve defining the level of care at which it is delivered; supplies needed health care workers and their cadres plus any other required service such as laboratory tests).

A frequent, often justified, criticism of cost effectiveness analysis is that they address only one of many criteria that could be used to evaluate health interventions. However determining how one might weigh cost effectiveness ratios alongside these other considerations when setting priorities for spending is difficult. It is always important to indicate whether the data was obtained by modeling or by actual measurements (Primer on cost-effectiveness analysis, 2009).

In either modeling or actual measurement approach, debate exists about how to attach dollar amounts to utilization. Even if the effectiveness data are from randomized trials, it is important to consider whether it pertain to the population and the nature of setting to which it is likely to be applied (Primer on cost-effectiveness analysis, 2009).

Given that almost half the disease burden in the low and middle income countries is from non communicable diseases and diseases burden per head in sub-Saharan Africa and the low and middle income countries of Europe and central Asia increased in 1990-2001 (Lopez, et al., 2006), cost effective interventions are necessary to enable low and middle income countries to manage with meager resources (Jamison, et al., 1993). If a country were to reallocate funds and efforts from costly interventions and instead apply them to relatively more cost effective interventions, substantially more people would be able to live longer and healthier lives.

Despite uncertainties, further gains in health in poor countries could be achieved in relatively short time if the choices of intervention are evidence based and planned with knowledge about potential costs and gains, and a thorough understanding of disease burden. Current data provides such guidance which should be rationally applied in order to accelerate the achievement of the millennium development goals (Lopez, et al., 2006).

Kenya is among the low and middle income countries (LMICs) with no data on cost and effectiveness of the available alcohol dependence treatments. The current study is therefore a

step in offering important research evidence on the practicability of providing cost effective treatment for alcohol dependent persons.

## 2.11.0 Alcohol policy

Measures applied in various countries to control the supply and demand for alcohol is referred to as alcohol policy. Educating the people, treatment programmes, alcohol control and harm reduction strategies are some of the measures that have been used (Babor, 2002).

There has been a growing interest in the scientific study of alcohol policy as a useful ally in combating the effects of alcohol related problems, and decision makers are now better equipped to make informed policy choices in light of the current scientific evidence on alcohol policy. Bruun, et al. (1975) highlighted the fact that alcohol problems could be prevented and that national governments and international agencies and organizations should take a firm role in shaping effective and rational alcohol policies.

Three main categories of alcohol policy exist, namely population based policies, problem - directed policies and direct interventions (Godfrey and Maynard, 1995). Population based policies are aimed at altering levels of alcohol consumption among the population. Population based policies usually affect all drinkers rather than targeting only the problem drinkers. They are however the policies (other than school based education and health promotion campaigns), with a demonstrated effectiveness. Population based interventions includes 'policies on taxation, advertising, availability controls, rationing and state monopolies, promotion of beverages with low or no alcohol content, regulation of density of outlets, hours and days of sale, drinking locations, minimum drinking age, health promotion campaigns and school based education' (WHO, 2004(a)).

Problem directed policies are more focused and aimed at specific alcohol related problems. Such policies are therefore unlikely to affect only the problem drinkers while sparing the non problem drinkers. Though such a specific focus may result in reduction of a particular problem, early detection of other problems may be missed (Godfrey and Maynard, 1995). It is therefore important that intervention policies though remaining focused encompass a wider view of alcohol related problems and their solutions. Examples of problem directed policies

include, random breath testing for drivers and punishment of offences related to alcohol use (Godfrey and Maynard, 1995).

Direct interventions policies targets the alcohol drinking individuals and includes brief interventions, treatment and rehabilitation programmes. Though such interventions have the potential to improve the quality of life of the individual they take time to produce noticeable change in communities with high levels of alcohol related problems (Godfrey and Maynard, 1995).

### 2.11.1 Current Alcohol Policy Trends

Alcohol policy as a concept may not even exist in the official terminology in many countries, and the definition of alcohol is usually part of agricultural and industrial policy rather than in health and social policy (Holder, et al., 1998; WHO, 2004(b)). This is especially true for the Eastern Africa countries where policies are largely absent and even those that are present are poorly enforced.

The current international trend is harm reduction in certain groups of people in specified areas. This is a shift from the previous focus on population based policies that targeted the reduction of alcohol consumption (Sewel, 2002).

Data indicates that a number of alcohol policies implemented by the various countries are rarely based on scientific research. It is important to subject alcohol policies to scientific scrutiny irrespective of whether they are science or not because by doing so, one can determine their success in attaining a desired outcome, can be repeated with same results, need for changes, and policies that should not be implemented (National Institute on Alcohol Abuse and Alcoholism (NIAAA, 1993).

Relevant stakeholders should be involved in policy making in order to develop an effective and sustainable alcohol policy. In addition, public awareness and support is needed in successful policy implementation in order to avoid resistance, make enforcement and maintenance of any restriction easy. It Public support is necessary and when available produces improvement in public health (Edwards, et al., 1994). Use of combination of

strategies from the three categories is likely to be more effective in reducing the level of alcohol consumption problems (Edwards, et al., 1994).

Alcohol policy is largely absent in Kenya or where partly present implementation and enforcement have been poor or absent. The need for alcohol policy has been acknowledged. 'NACADA recognizes that abuse and misuse of alcohol and other drugs in Kenya has now reached magnitudes that may lead to a national disaster if timely measures are not put in place (Kimani, 2006). Currently alcohol policy making is in process.

There is no legal definition of an alcoholic beverage (measurable in alcohol by volume) is important Ideally the definition should be at an alcohol content level low enough to include most of the alcoholic beverages consumed in the country. Defining an alcoholic beverage determines how much of alcohol by volume must an alcoholic beverage of a particular type (WHO, 2004(a)).

Some of the existing alcohol legislation in East Africa has been there since the colonial era and have not been modified to suit the contemporary socio economic changes. There is a laxity among policy makers in East Africa to institute alcohol policies, to implement and enforce existing legislations. Worse still is the tendency to withdraw useful legislation, an example being the withdrawal of the breathlyaser test in Kenya after a court injunction in 2006 and the debate in parliament in 2006 over legalization of traditional brews (Daily Nation, 18/6/06).

Summarized below later is the current status of the various alcohol policies in Kenya, Uganda and Tanzania.

## 2.11.2 Alcohol Policies in East Africa

POLICY

| | KENYA | UGANDA | TANZANIA |
|---|---|---|---|
| State monopoly of production and Sale of alcohol | Absent | Absent | Absent |
| Existing registration on opening hours | Present | Present | Present |
| Age of consumption | 18 yrs | 18yrs | 18 yrs |
| Traditional alcohol registration | Present * | Present | Present |
| Restriction on hours of sale | Absent | Absent | Absent |
| Restriction on days of sale | Absent | Absent | Absent |
| Restrictions on places of sale | Absent | Absent | Absent |
| Restriction on density of outlets | Absent | Absent | Absent |
| Level of enforcement | Absent | Absent | Absent |
| License for production and sale | Present | Present | Present |
| Alcohol Maximum BAC levels | 0.8 ** | 0.8 ** | 0.5 ** |
| Use of Random breathe testing | No | No | No |
| Differential taxation on alcohol products | Present | Present | Present |
| Alcohol as component of national HIV strategic plan | Present | Present | Present |
| Trend in prices of alcohol | Increase | Stable | Stable |
| Alcohol sponsorship and Promotion | no | no | no |
| Alcohol sponsorship and Promotion | no | no | no |
| Restriction on advertising and sponsorship | no | no | no |
| Health warnings | no | no | no |
| Restrictions of alcohol consumption in public offices | Banned | Banned | Banned |
| On-premise license (bars, café, pubs, restaurant | Present | Present | Present |
| Off- license (shops, kiosks, retail stores, supermarkets | Present | Present | Present |

* Legislation exists from colonial era

BAC- blood alcohol concentration levels

RBT-random breathe test

** Expressed in per mille (0/00)

Reference for Data for Uganda and Tanzania: WHO global report on alcohol policy, (2004)

# Chapter Three

## Research scope

### 3.1 Problem Statement

Alcohol abuse and dependence is a major problem in most informal settlements in Kenya, the study area included. There are no treatment facilities to deal with the alcohol abuse and dependence in Kangemi location and many of the affected are helpless and succumb to the alcohol related health, social, financial and legal problems. Although a baseline study by Ndetei et al., (2006), documented the fact that alcohol abuse and dependence was prevalent in Kangemi, no intervention measures have been instituted to deal with the alcohol problems.

In addition the cost and the effectiveness of the treatments available in Kenya have not been studied nor has the policies in place been evaluated. There is need to research on the cost effectiveness of available interventions for alcohol dependence treatment and compare them with new inventions.

### 3.2 Research questions

a) How effective is community based detoxification and rehabilitation of alcohol dependent persons in Kenya?
b) How effective is institution based detoxification and rehabilitation of alcohol dependent persons in Kenya?
c) What would be the cost of community based detoxification and rehabilitation in Kenya?
d) What is the cost of institution based detoxification and rehabilitation in Kenya?
e) How cost effective is community based detoxification and rehabilitation (CBDR) compared to institution based detoxification and rehabilitation (IBDR) of alcohol dependent persons?
f) What are the co morbid disorders in alcohol dependent persons in Kenya?
g) What is the chemical composition of alcohol sold in the area of community based study in Kangemi, Kenya?

## 3.3 Justification

It is the role of health professionals and researchers to explore methods of treatment that are affordable, available, accessible and appropriate to the majority of the alcohol dependent persons. Such treatments should be effective as well as safe. Up to date treatment for alcohol dependence in Kenya has been done in rehabilitation centres, necessitating the clients to be admitted for a minimum of 3 months. This is not only expensive, but also prohibitive to those that are employed and cannot get three months leave.

Although no research has been done to determine the effectiveness of institution based detoxification and rehabilitation of clients in Kenya, anecdotal reports from clinicians are discouraging. According to the psychiatrist in charge of the only public rehabilitation at Mathari hospital, relapse rates are high and only an estimated 25% have remission lasting the year after discharge. (Approximately 90% of alcohol dependent persons are likely to experience one relapse over the 4-year period following treatment (Polich, 1981). Although the study by Polich was in the 80s the rates of relapse continue to be high. Other studies have estimated long term relapse rates to vary between 20 and 80% (Finney, et al., 1999; Jin, et al., 1999).

Co morbidity may increase the relapse rates. Ndetei et al. in a clinical epidemiology study in the main referral psychiatric hospital in Kenya established that DSMIV substance use disorders, major psychiatric disorders and anxiety disorders were prevalent and co morbid (Ndetei, et al., 2008). Such co existing psychiatric disorders makes patients unable to function or adjust effectively in the society leading to relapse.

The current study aims to compare the cost effectiveness of CBDR with that of IBDR and to offer research based information that would aid in developing alcohol treatment interventions that are safe, affordable and effective.

## 3.4.0 Aim

The aim of the study was to establish that community detoxification and rehabilitation of alcohol dependent persons is a cost effective intervention.

### 3.4.1 Specific objectives

The specific objectives of the study were to determine the;

i. effectiveness of CBDR of alcohol dependent persons,
ii. effectiveness of IBDR of alcohol dependent persons,
iii. financial cost of CBDR of alcohol dependent persons,
iv. financial cost of institution based detoxification and rehabilitation (IBDR) of alcohol dependent persons,
v. cost effectiveness of CBDR and IBDR of alcohol dependent persons,
vi. co morbid disorders in alcohol dependent persons,
vii. chemical composition of alcohol used in the area of study.

### 3.4.2 Research hypothesis

There is a difference in cost effectiveness between CBDR and IBDR of alcohol dependent persons, with the former being more cost effective than the latter.

# Chapter Four

## 4.0 Methods

### 4.1 Research design

The study was prospective in design. The community based group underwent detoxification and rehabilitation period in which they were followed up within the community for six months. The institution based group on the other hand were admitted at the rehabilitation centres and discharged from the rehabilitation centre after three months. They were contacted and questioned at six months through a telephone conversation.

### 4.2 The Study Area (community based group)

The study was done within the informal settlement community (slum) around Kangemi Health Centre in Kangemi location. Administratively the nation of Kenya is divided into 8 provinces, namely Nairobi, Central, Coast, Western, Eastern, Nyanza, Rift Valley and North Eastern. The provinces are further divided into districts, while the districts are divided into divisions, which are further divided into location and sub locations. The sub location is the lowest government administrative level. The inhabitants of the sub location are further divided into villages each with a head referred to as a village elder.

The Kangemi informal settlement is located in Kangemi location, in Westland's division, Nairobi West District in Nairobi (city) province, Kenya. It is divided into 12 villages; each with a village head or elders (a resident chosen by the members of a village). The village heads are invaluable associates and confidants of the chief (government head of a location) and work very closely with him/her and the three assistant chiefs (government head of a sub location).

Kangemi is not a typical urban slum. (In a typical slum the buildings are in poor dirty condition with often overcrowding of people). Many people living in Kangemi are long-time residents, offspring's of long-time residents or close relatives. A good number of the residents have title deeds to the land and the homes built on the land. However, with the expansion of Nairobi, Kangemi has grown exponentially in the last decade, arising from high birth rates in

the settlement and also substantial numbers of people having migrated from the rural area in the neighbouring Kiambu District and many of these people have set-up temporary homes there. Kangemi is more of an established informal settlement (Ndetei, et al., 2006). Over 80% of the people are tenants who are mainly unemployed or of low skill labour, living in low cost informal residential units.

The Kangemi health centre serves the surrounding population of 100,000 people (Kenya National Bureau of Statistics, 2007). Kangemi health center operates on outpatient basis and conducts various follow-up clinics namely: maternal and child welfare clinic, antenatal clinic, tuberculosis clinic, mental health clinic and Kenya anti-HIV vaccine initiative (the last 2 being part of recent development).

There has been a key development in Kangemi recently. In May 2006 a weekly mental health clinic was initiated by an NGO, BNKE in conjunction with AMHF at Kangemi health centre as a pilot study of decentralization of mental health services in Kenya. By June 2007 this programme was reaching 729 mentally ill people and an almost equal number of the primary care takers of the mentally ill in the area.

Before the intervention of BNKE in Kangemi there was no formal mental health services in the area (Ndetei, et al., 2006) and it is among the only two that offer mental health services at community level in the country. Thirty community based volunteers (health workers) have been identified and trained in Kangemi. These volunteers conduct a community outreach to the mentally ill persons in the community and are an important link between the health professionals at the Kangemi health centre, the BNKE and the community. A total of 9 general health staffs have been trained on community health through BNKE and its partners (Ndetei, et al., 2006).

Patients with various illnesses are seen at the Kangemi health center clinic by different staff cadres in the medical profession; a psychiatrist and a clinical psychologist (both visit weekly), a social worker, a general practitioner, 4 clinical officers, 8 nurses (of various cadres), university medical students visiting the health centre weekly for psychiatry experience.
A psychiatrist, a clinical psychologist, a clinical officer, a psychiatric nurse, social worker manage the mental health clinic at the health centre. The community based health workers are useful in following up the patients within the community. This however is not a typical

Kenyan health centre, but one whose operations have benefited from decentralization of medical services by the government with the assistant of NGO's like BNKE and AMHF.

The community based intervention was done at the community level at a health centre. A health centre is a facility that offers health services at the community level. The Kenya health system is organized into 5 different levels. Level one is referred to as a dispensary and this is the lowest level at which basic health services for minor ailments are offered. The health centre is the next level of health management. A health centre offers maternal and child health care services and general medical services and minor surgical services. All those requiring major medical, surgical services or other unavailable services are referred to the next level which is the sub district hospital. For difficult cases referral is made to District hospital, Provincial hospital and the National hospital in that order.

Mental health services are normally offered at the district level but there has been a process of decentralizing the services with two-health centre piloting the process of decentralization. Kangemi health centre (area of current community based intervention) is one of the two health centres that offer outpatient mental health services.

## 4.3 Study Area (Institution Based Group)

The institution based group was obtained from three rehabilitations, two of which were under the same administration. Asumbi - Karen rehabilitation is 20km south west of Nairobi while Asumbi - Ridgeways is 10 km north east of Nairobi. The capacity for each of these two rehabilitation centres was 35 beds. Twelve beds were reserved for female clients and the remaining 23 beds were for male clients. The minimum period of stay at the two centres is three months at total cost of Kshs 63000 (900 USD); the cost has since been increased to Kshs 80,000 (1142 USD). The two centres are mission based and therefore the cost subsidized. The patients joining the rehabilitation centres are of two categories, patients that come directly to the rehabilitation centre without undergoing detoxification and a second category that had undergone detoxification in private hospitals for 7- 20 days before joining the rehabilitation centre. In both the rehabilitation centres the patients are taken through a three-segment programme involving 2 weeks of orientation, 18.5 weeks of primary treatment and 2 weeks of planning for discharge. The primary treatment includes the 12 steps of brief intervention

similar to what is practiced by the AA and the Narcotic Anonymous (NA), group therapy plus training on coping skills. The therapists are psychologists. Patients that need medical or psychiatric help incur an extra cost for the doctors' consultation.

The third rehabilitation centre was Red Hill located approximately 30 km North West of Nairobi. It has a 35-bed capacity with 26 male and 8 female beds. The clients are expected to remain in the rehabilitation centre for a minimum of 90 days at a total cost of Kshs 180, 000 (USD 2,571), currently at Kshs 220,000 (3,142 USD). The centre also admits some clients directly from home or from their places of work, while doctors refer others from hospitals after 7- 20 days period of detoxification. The 90 days treatment includes individual, family and group therapy, focused group discussions, 12 steps of brief intervention similar to the AA and NA programmes and a one-day retreat for evaluation of programme. None of the three rehabilitation centres has a regular after care programme for their clients after they are discharged and data on relapse and remission rates are not available.

In total there are 63 rehabilitation centres in Kenya (NACADA 2008). Only one of the rehabilitation centres is a public rehabilitation facility with a low cost while the rest are either mission based or private.

### 4.4.0 Study Population

One hundred and eighty eight (188) purposefully selected alcohol dependent subjects from community served by Kangemi Health Centre represented the community based study group while eighty eight subjects admitted in private rehabilitation centres during the study period, represented the institution based study group.

### 4.4.1 Sample Size

The sample size for comparing the cost effectiveness of community based and institution based rehabilitation interventions was calculated using formula for comparing two proportions. The sample size determination considered proportion of remission for outpatient treatment after 6 months as 0.59 (Mundle, et al., 2001) and 0.35 for the institution based (reported by Miller, et al., 2001; Monahan, et al., 1996). Assuming the significance level of 0.05 and 90% power, we

required 97 individuals for community based as well as institution based, i.e. assuming equal size for both groups. The sample size determination was done using STATA software (Chow et al., 2008), which uses the following formula;

$$n = \frac{2\bar{p}(1-\bar{p})(z_{1-\beta} + z_{1-\alpha/2})^2}{(p_1 - p_2)}$$

$n$ is Sample size in each group (assumes equal sized groups), $\bar{p}$ is A measure of variability (similar to standard deviation), $(p_1 - p_2)$ Effect Size (the difference in proportions), $z_{1-\beta}$ Represents the desired power (typically .84 for 80% power) and $z_{1-\alpha/2}$ Represents the desired level of statistical significance (typically 1.96).

In conducting the study, there were 188 individuals for community based and 88 for the institution based. Using back calculation using STATA to determine the power of study, we have a power of 95% (greater than 90%). Therefore, the study still had enough power despite having 88 individuals for institution based less than 97 as required from our sample size determination.

## 4.5.0 Inclusion Criteria

The community based consenting participants aged 18 years and over were included in the study if they were alcohol dependent with an AUDIT score of 15-40 (for males) and 13-40 (for females). The cut off points are far above the cut off of 8 which is considered to be the point at which an individual is alcohol dependent. This was because many individuals in the Kangemi community are heavily dependent and people scoring 8 on the AUDIT would not be considered to have an alcohol problem worth treating.

Although an AUDIT screen was done for the institution based participants, all consenting persons aged 18 years and over were recruited into the study. This was on the basis that their admission to the rehabilitation centre was due to alcohol dependence that necessitated admission.

### 4.5.1 Exclusion Criteria

Excluded from the study were participants of community based group with an AUDIT score of < 15 (for males) and < 13 (for females). Those unavailable or unwilling to join the community based or institution based study for the 6 months. Also excluded were those suffering from severe medical and neuro psychiatric complications (including delirium tremens, active psychosis, and suicidal, severe memory difficulties) at time of first contact.

## 4.6.0 Research Instruments

### 4.6.1 Available Types of Alcohol Screening Instruments

The purpose of alcohol screening is to identify individuals in a patient's population who have begun to develop or who are at risk for developing alcoholism. A detection instrument is valuable because it provides a structured, disciplined and consistent means to detect individuals at risk. According to Teare et al., 1993, there are two types of alcohol screening instruments available namely, self report questionnaires and structured interviews and secondly, clinical laboratory tests which can detect patho physiology, associated with excessive alcohol consumption.

Both should be valid (i.e. measure what the clinician or researchers is attempting to measure) and it is important to note that self report interviews and questionnaires have greater sensitivity and specificity than routine blood test for biochemical markers (Bernadt, 1982). Laboratory tests may be used most successfully in conjunction with self report instruments to enhance objectively (Lumeng, 1986; Watson, 1986; Yates, 1987).

### 4.6.2.0 Alcohol Use Disorders Identification Test (AUDIT)

The AUDIT was developed by WHO in a multi centre and cross-cultural project in the 1980s. The AUDIT is the only screening test specifically designed for international use that has the following characteristics; Identifies hazardous and harmful alcohol use, as well as possible dependence; it is brief, rapid, and flexible and is designed for primary health care workers (Babor, et al., 1993). A variety of subpopulations have been studied, including primary care

patients (Volk, et al., 1997; Rigmaiden, et al., 1995; Piccinelli et al., 1997) emergency room cases, drug users (Skipsey, et al., 1997); the unemployed (Claussen, et al. 1993); University students (Fleming, et al., 1991; Powell, et al., 1994); elderly hospital patients (Powell, et al 1994); and persons of low socio economic status (Isaacson, et al., 1994).

The AUDIT has been found to provide good discrimination in a variety of settings where these populations are encountered. A systematic review of the literature by Fiellin, et al., 2000 has concluded that the AUDIT is the best screening instrument for the whole range of alcohol problems in primary care, as compared to other questionnaires such as the CAGE and the MAST. AUDIT performed better than the four item screening tests for alcohol dependence (CAGE) in identifying adolescents and young adults with current alcohol use disorders (Cook, et al., 2005(c)).

It has a high degree of specificity and sensitivity and is culture free. A study by Giang, et al, 2005 found that AUDIT had a sensitivity of 81.8% and a specificity of 76.1% for detecting at risk drinking in rural Vietnam. At a cut off point of 7/8 the study concluded that AUDIT was feasible to use in rural communities (Giang, et al., 2005).

Dolman et al (2005) in a study of inpatients admitted to a general hospital using AUDIT and biochemical markers concluded that AUDIT was a useful screening instrument in general medical setting. He also established that its ability to correctly predict which patients experience alcohol withdrawal, increased when used in combination with biological markers (Dolmans, et al., 2005).

A study on the psychometric properties of AUDIT by Torres et al 2005 in a female population with alcohol problems against a gold standard found that AUDIT had good psychometric properties and was valid for detecting dependence and risk alcohol consumption in women (Tores, et al., 2005). A study by Gache, et al., 2005 in a primary health care setting in France reported that the AUDIT questionnaire remained a good screening instrument for French speaking primary care while a study in a population of emergency service patients in Poland found the AUDIT to be significantly better than other instruments for alcohol dependence in Warsaw. It required a cut-off point of 8 with females (Cherpitel, 2005).

### 4.6.2.1 AUDIT Scoring and Interpretation

As yet there has been insufficient research to establish precisely a cut-off point to distinguish hazardous and harmful drinkers (who would benefit from a brief intervention) from alcohol dependent drinkers (who should be referred for diagnostic evaluation and more intensive treatment). This is an important issue because screening programmes designed to identify cases of alcohol dependence are likely to find a large number of hazardous and harmful drinkers if the cut-off of 8 is used. These patients need to be managed with less intensive interventions. In general, the higher the total scores on the AUDIT, the greater the sensitivity in finding persons with alcohol dependence.

Based on experience gained in a study of treatment matching with persons who had a wide range of alcohol problem severity, AUDIT scores were compared with diagnostic data reflecting low, medium and high degrees of alcohol dependence. It was found that AUDIT scores in the range of 8-15 represented a medium level of alcohol problems whereas scores of 16 and above represented a high level of alcohol problems (Babor, et al., 2001). On the basis of experience gained from the use of the AUDIT in this and other research, it is suggested that the following interpretation be given to AUDIT scores:

- Scores between 8 and 15 are most appropriate for simple advice focused on the reduction of hazardous drinking.
- Scores between 16 and 19 suggest brief counseling and continued monitoring, scores of 20 or above clearly warrant further diagnostic evaluation for alcohol dependence and a greater need for more intensive treatment.
- More detailed interpretation of a patient's total score may be obtained by determining on which question points were scored.
- In general, a score of 1 or more on question 2 or question 3 indicates consumption at a hazardous level.
- Points scored above 0 on questions 4-6 (especially weekly or daily symptoms) imply the presence or incipience of alcohol dependence.
- Points scored on questions 7-10 indicates that alcohol-related harm is already being experienced.

The total score, consumption level, signs of dependence, and present harm, all should play a role in determining how to manage a patient. The final two questions should also be reviewed

to determine whether patients give evidence of a past problem (i.e., 'yes, but not in the past year'). Even in the absence of current hazardous drinking, positive responses on these items should be used to discuss the need for vigilance by the patient.

In general health care settings and in community surveys, most patients will score under the cut-offs and may be considered to have low risk of alcohol related problems. A smaller, but still significant, portion of the population is likely to score above the cut-offs, but record most of their points on the first three questions. A much smaller proportion can be expected to score very high, with points recorded on the dependence related questions as well as exhibiting alcohol related problems.

Selection of the cut-off point should be influenced by national and cultural standards and by clinician judgment, which also determine recommended maximum consumption allowances. Technically speaking, higher scores simply indicate greater likelihood of hazardous and harmful drinking and in most cases the total AUDIT score will reflect the patient's level of risk related to alcohol.

Total scores of 8 or more are recommended as indicators of hazardous and harmful alcohol use, as well as possible alcohol dependence. (A cut-off score of 10 will provide greater specificity but at the expense of sensitivity.) Since the effects of alcohol vary with average body weight and differences in metabolism, establishing the cut off-point for all women and men over age 65 one point lower at a score of 7 will increase sensitivity for these population groups (Babor, et al., 2001).

At the recommended cut-off of 8, most studies have found very favourable sensitivity and usually lower, but still acceptable, specificity, for current ICD-10 alcohol use disorders (Allen, et al., 1997, Cherpitel, et al., 1995, Conigrave, et al., 1995), as well as the risk of future harm (Conigrave, et al., 1995). Nevertheless, improvements in detection have been achieved in some cases by lowering or raising the cut-off score by one or two points, depending on the population and the purpose of the screening programme (Cherpitel, et al., 1995).

In Nigeria (Africa), the AUDIT at a cut off point of 5 and above has been found to clearly identify respondents with alcohol related problems with sensitivity of 0.935 and specificity of 0.915 (Adewuya, 2005).

The current study used an AUDIT cut off point of 13 and above for females and a score of 15 and above for males for community based treatment participants. At this cut off point, most of the persons with medium and high alcohol problems were enrolled for the study. The institution based participants were enrolled into the study at the point of admission to the rehabilitation centres. Some of them had undergone detoxification while others had not. All willing subjects admitted for institution rehabilitation were enrolled for the study irrespective of their AUDIT score and no AUDIT cut off point was set for this group and the scoring was done in relation to the drinking status before treatment.

### 4.6.3 ASSIST Questionnaire

The alcohol, smoking and substance involvement screening test (ASSIST) is a brief screening questionnaire to detect people's use of psychoactive substances. It was developed by the WHO and an international team of substance use researchers as a simple method of screening for hazardous, harmful and dependent use of alcohol, tobacco and other psychoactive substances. Phase I of the WHO ASSIST project was conducted in 1997 and 1998 while the second phase was conducted in the year 2000 to 2002. (Edwards, et al., 2003).

The development of the ASSIST builds on previous work by the WHO to advance alcohol screening and brief intervention through the development and validation of the AUDIT. The success of the AUDIT project in promoting alcohol screening and brief intervention and its effectiveness in reducing alcohol related problems provided the impetus for the extension of screening and brief intervention to other substance abuse problems and the methods used provided a model for the ASSIST project. Like the AUDIT, the ASSIST was designed specifically for international use in primary care settings and to identify; those whose patterns of substance use put them at risk of problems, those who have already developed problems related to their substance use, those at risk of developing dependence. The ASSIST provides information about: the substances people have ever used in their lifetime; the substances they have used in the past three months; problems related to substance use; risk of current or future harm; dependence; and injecting drug use. (Edwards, et al., 2003).

The ASSIST has been specifically designed for use in primary health care settings to help practitioners identify patients who would benefit from cutting down or stopping their

substance use. Primary health care settings are ideal places to undertake screening and prevention activities.

The ASSIST has been found to be a valid screening test for alcohol, cigarette and other substances (Newcombe, 2005). In addition, the ASSIST is useful in identifying the problems associated with alcohol abuse (health, social, legal and financial). In the current study, the ASSIST was used to identify other substances used by the participants and also the problems related to alcohol use and to determine the extent of alcohol craving.

### 4.6.4 Social Demographic Questionnaire

This questionnaire was designed by the researcher to obtain information on social demographic factors which included the sex age marital status, religion, occupation, education, number of children, marital status, monthly income, residence, name of chief and sub chief, age at which they started using alcohol, who introduced them to alcohol, reason for using alcohol and the persons contacts. The social demographic questionnaire used for the institution based group had an added section designed to obtain data on the cost of detoxification where applicable and rehabilitation where applicable for the participant. Data was collected on the cost of drugs, admission, doctor's consultation and period of stay in hospital.

### 4.6.5 Composite International Diagnostic Interview (CIDI)

The CIDI is a comprehensive, fully structured interview designed to be used by trained lay interviewers for the assessment of mental disorders according to the definitions and criteria of Classification of Mental and Behavioral Disorders Volume 10 (ICD-10) and the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV). It is intended for use in epidemiological and cross-cultural studies as well as for clinical and research purposes. The diagnostic section of the interview is based on the WHO's CIDI (WHO CIDI, 1990). The CIDI allows the investigator to: measure the prevalence of mental disorders, measure the severity of these disorders, determine the burden of these disorders, determine who is treated, remains untreated, and the barriers to treatment (WHO, 2004(b)). All surveys use the WMH-CIDI, a fully structured diagnostic interview, to assess disorders and treatment. Disorders considered include, anxiety disorders (agoraphobia, generalized anxiety disorder, obsessive-compulsive

disorder, panic disorder, posttraumatic stress disorder, social phobia, specific phobia), mood disorders (bipolar I and II disorders, dysthymia, major depressive disorder), disorders that share a feature of problems with impulse control (bulimia and intermitted explosive disorders) and substance disorder( alcohol abuse and dependence, drug abuse and dependence, nicotine). Disorders are assessed using the definitions and criteria of DSM-IV and the ICD-10. CIDI organic exclusion rules were imposed in making all diagnoses. Methodological evidence collected in the WHO CIDI field trials and later clinical calibration studies showed that all the disorders considered herein are assessed with acceptable reliability and validity both in the original CIDI and in the original version of the WMH-CIDI (Harvard School of medicine 2005).

Training in the computer Assisted Personal Interview (CAPI) version or the paper and pencil (PAPI) version is necessary before use. The Principle Investigator (P.I) and assistant researcher were trained by Ndetei (who is a trained trainer at the University of Michigan USA, supported by WHO) on how to use the CIDI instrument. The PAPI version of CIDI was used in the current study.

### 4.6.6 Follow up Questionnaires (For community based group)

The follow up questionnaires were researcher designed to obtain the following data; identity of the individual, history of alcohol use in the last one week and amounts used if any, craving for alcohol, challenges faced by participants within the last week and symptoms experienced.

The questionnaire designed for use by the P.I, was slightly different from that of the CBHW in that medical terms were used to inquire on the symptoms experienced and the willingness of the participant to continue with the study was recorded. Both questionnaires were filled weekly and data coded and stored in computer.

### 4.6.7 Follow up Questionnaire (for institution based group)

A telephone call follow up questionnaire was designed to reach the institution based group after six months. The institution based group participants could not be physically contacted,

because they were in a protected environment in the rehabilitation centres for 3 months, after which they were discharged.

The questionnaire was designed to collect the follow up data, identify the individual and history of alcohol use since discharge from rehabilitation centre. Telephone numbers of the participant and other significant information was obtained from the rehabilitation centre admission form. All participants had such a contact. The telephone call was directed to a person significant to the participants (spouse, parent or sibling).

## 4.7.0 Procedure

### 4.7.1 Training of Community Based Health Workers (CBHW)

The process commenced by recruiting and training CBHW and staffs at Kangemi health center. These individuals were identified with the help BNKE and AMHF who had trained and worked with them in the same community before. The best (as rated by BNKE and AMHF) 10 CBHW and 3 Kangemi health centre staff were recruited and trained. A training manual (appendix J) developed by the principal researcher was used. The training was conducted for two days at Kangemi Health Centre and the trainers included a psychiatrist and two clinical psychologists. The scope of training included an introduction to alcohol use and related problems including alcohol dependence, dangers of alcohol abuse and dependence, identifying persons with alcohol dependence, recruitment of study participants including basic issues related to study ethics and follow up of study participants in the community after detoxification and how to fill the follow up questionnaires provided by the researcher. A researcher designed training manual (appendix D.8) was used for the training.

A basic knowledge of the study procedure including detoxification process, withdrawal symptoms, community based rehabilitation and related ethical issues were conveyed to the trainees. Knowledge of the study instruments and their purpose was also included in the training.

The benefits of the study to the participants and community in general were explained to the trainees. They were prepared to face the challenges of collecting quality data and also taught on how to recruit alcohol dependent persons. Two psychologists from each of the rehabilitation

centres were also approached and requested to help in data collection at the rehabilitation centre. They received similar training upon accepting to assist in data collection.

### 4.7.2 Detoxification Process (community based group)

The first 188 alcohol dependent persons were consecutively recruited into the community based group. Medical personnel attending to patients in the various Kangemi health centre clinics were requested to refer all cases presenting with history of alcohol intoxication/ withdrawal or other related problems to the PI. Similarly the community based health workers referred persons from the Kangemi sub location who had alcohol related problems to the P.I at Kangemi health centre. Those who were aged 18 years and above and fulfilled the other inclusive criteria within the recruitment period (six months) were engaged in the next stage of study by the principal investigator.

Information regarding the procedure, the purpose, the duration of the study was given to the participants (verbally and in writing). Also included in the consent explanation were the medications to be used including any expected side effects, the discomfort from the injection to be given and the confidentiality of information they gave. They were also informed that the exercise was voluntary and they could withdraw at any stage of the study. After informed consent the PI and assistant screened the participant using the AUDIT.

Male participants who scored 15 and above and women who scored 13 and above on the AUDIT score were recruited for the study if they fulfilled other inclusion criteria. Those who scored below the AUDIT cut off point were excluded from the study. Those who needed immediate medical attention were referred to Kangemi outpatient clinic for management or further referred to Kenyatta National Hospital (KNH) but were free to join after they recovered. The consenting AUDIT positive persons were subjected to a detailed socio demographic questionnaire that contained information to enable the researcher to follow up subjects into the community.

The CIDI was then administered to the subjects at the start of the study for diagnosis of DSM-IV axis1 co morbid disorders. Those with co morbid disorders were included in the study but referred to Kangemi Outpatient Psychiatric Clinic for treatment. The instrument was

administered again at the end of the six months to compare the co morbidity at the beginning of study with that at the end of the study.

The ASSIST instrument was administered at intake of subjects and at end of study (six months). The purpose of this instrument was to identify the pattern of drinking, the health, social, financial, legal problems and determine poly drug use both at the beginning and end of the study.

The principal investigator assisted by a nurse administered parenteral (intravenous) Pabrinex 1& 11 every morning for 3 days to each participant. Each person would then be supplied with oral diazepam 5mg and carbamazepine 200mg to take at night for the first five and ten nights respectively to all participants as prophylactic management for withdrawal symptoms and other related problems (this is a standard treatment by most psychiatrist in Kenya for detoxification of severely dependent persons and also in conformity with practice elsewhere as per literature review.

The number of subjects taken every three days for detoxification did not exceed 20 persons and any excess persons would be recruited in the next group. This was to enable the researchers to effectively manage the subjects better. Daily assessment of the subjects was done in the first 5 days to determine any withdrawal symptoms and other medical problems and this was recorded in a structured format (appendix C5).

Each individual was expected to remain in the programme for a period of 6 months. The six month were the researchers' estimated period required to motivate the participants to develop positive change in their thinking and behaviour and coping mechanism to enhance the probability of further abstinence. Research indicates that for most patients, the threshold of significant improvement is reached at about 3 months in treatment. After this threshold is reached, additional treatment can produce further progress toward recovery (NIDA, 1999). Mundle, et al., (2001), considered six months outcome after alcohol dependence treatment to be a short term follow up. Normally patients receiving treatment in rehabilitation centres are expected to remain in treatment for a period of 3 months.

### 4.7.3 Follow-up of community based participants

Rehabilitation of the persons began after the ten days of detoxification. There was documented follow-up at home for each participant by the CBHW twice a week, and the principal researcher or assistant (once a week) at KHC for a period of 6 months. A questionnaire (C4, C5) was used to determine whether individual was abstaining from alcohol and other difficulties he/she may be experiencing. This was filled once a week by the principal researcher and twice a week by the CBHW. Both the P.I and the CBHW reports regarding the drinking status were compiled weekly. Any discrepancy between the two structured reports was confirmed by a home visit by the CBHW.

Record of participants that did not wish to be visited by the CBHW was taken. At the end of six months participants were subjected to the ASSIST and CIDI instruments marking the end of the study. At the end of six months the weekly records were analyzed for each participant. The study groups were encouraged to join self help groups of their choice and to remain abstinent.

### 4.7.4 Focused group discussions / self help group (community based group)

Group therapy (in groups of 20) was instituted on the third week and there were bimonthly meetings for each group. The group regulations were spelt out at the beginning of every session which included respect for others members. No member was allowed to ridicule or laugh at other participants. The meetings were held on alternate Sunday afternoon and would last for one and a half hours. The session would begin with a prayer and a relevant reading from the bible. Thereafter the participants would be given time to talk of the fortnight experiences. Those unwilling to share were not compelled to do so.

The groups would then be facilitated by the P.I or the clinical psychologist to discuss on how to handle the challenges they were experiencing and to develop coping skills. Encouragement and motivation to remain abstinent was given and the benefits of abstaining from alcohol were discussed whenever necessary. In other occasions the members discussed the dangers of alcohol and other substance abuse. Members who were talented in singing or poetry would be allowed to sing or recite poems. Those that were good at music would sing while others would

have poems to share with the group. Personal experiences and challenges would be told to the group with the aim of educating the rest of members.

In the fourth month, the researcher requested the BNKE (an NGO) to help the participants form self help groups. This was considered during the research period when it became apparent that financial lack and idleness was contributing to relapse. The main purpose of the self help groups was to offer ideas on social economic issues and self development. Participants would meet twice a month on a Friday afternoon; the groups were also educated on how to use cheap available resources to make an income. By the end of the six months the participants had developed projects like manufacture and sale of liquid soaps and rearing of chicken. Assistance to initiate income generating projects was offered by BNKE. Joining the self help group was voluntary and those who were employed or chose not to join were not compelled. The group therapy meeting was terminated at 6 months and members were encouraged to continue with the self help groups or other alcohol treatment related programme like AA.

### 4.7.5 Institution based group

All 88 persons admitted for treatment of alcohol dependence in the three rehabilitations centres over the period of study were consecutively recruited as the institution based group.

The PI visited the rehabilitation centre before the commencement of the study and discussed the details regarding the study with the administrator in charge of the centres and received permission. Two psychologists working in each rehabilitation centre were trained on data collection and ethical issues of the study. Confidentiality was assured.

The clients whose reason for admission to the rehabilitation was alcohol related problems were offered consent explanation by any of the two psychologists before giving informed consent for the study.

The consenting persons had the AUDIT questionnaire administered on admission to the rehabilitation centre. The SDQ, ASSIST, and CIDI questionnaires were then administered irrespective of the AUDIT score since all the participants had qualified for admission into the

rehabilitation centre for alcohol treatment. The socio demographic questionnaire was similar to the one used for the study group except that there was an added section meant to derive information about the cost of institution based detoxification (where applicable) and rehabilitation.

Data regarding the cost, duration of the last detoxification (if any) were obtained from the patient or the relative or discharge invoices. Confidentiality of the patient was emphasized and the fact that participation was voluntary. There was little interaction between the institution based group and the principal investigator and most of the data collection was done by the two psychologists mainly because there was restricted movement into the rehabilitation centres by non staff members. It would also have been technically difficult for the P.I to recruit every person at the point of admission due to various admission times and it would have necessitated the PI to be stationed at the rehabilitation centre all days.

During the period of the study there was no after care of the clients after treatment in the rehabilitation centres. The PI and a psychologist called every participant next of kin after six months of joining the rehabilitation centre (3 months after discharge from centre). The next of kin was a significant person in the life of participant who had brought the participant to the rehabilitation centre and/or the person whose contact was indicated in the admission record as the next of kin. All the next of kin were either a parent/spouse or sibling. Through a telephone conversation the drinking pattern for the institution based group was obtained from significant others. After confirming the identity of the recipient, the psychologist would introduce himself and give the purpose of calling. He would then ask whether the participant was drinking alcohol or not (since discharge from the rehabilitation). If the answer was yes then, information on whether they were drinking the same or less than, or more than before rehabilitation would be obtained. The psychologist would then thank the next of kin and ask them to inform the participant that they were free to get in touch on that telephone line in case of any need. Information about those deceased (mortality rate) was obtained from the next of kin. Meanwhile the P.I would be listening and recording the responses of the recipients.

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## 4.8.0 Method of Cost Effectiveness Analysis

### 4.8.1 Community Based Detoxification and Rehabilitation Cost

The cost of CBDR was calculated from the actual cost of each item that was purchased without taking into account the discounts given by the retailers. The costs were recorded in Kenya shillings and then converted to the United States of America dollar (USD) at a standard conversion rate of seventy Kenya Shillings to one USD. The total cost of the intervention for each individual that completed the six months was the same since similar process of detoxification and rehabilitation was provided for each participants. Costs related to treatment of other co morbid disorders or cases referred to hospitals were not included. The community based intervention was calculated by adding the daily actual costs of treating the person for six months. The administrative and the cost of facility used for detoxification group meeting and reviews were added to the cost.

The actual cost of each item used on the participant was recorded and determined as follows: Cost of drugs, needles, syringes used was the current retail market price at which they were bought. The scope of the costs considered included the direct variable costs of providing either of the two interventions. This included the cost of materials (drugs, syringes, needles, cotton wool and salaries for the staff). The total cost of cotton wool used for the 188 participants was divided by 188 to obtain the quantity and cost of the surgical spirit and cotton wool. Doctor's consultation fee and group therapy fee was obtained from the Kenya Medical and Dentist Board (KMDB) allowed minimum fees. Other staff members' payments were calculated according to fees recommended by the governing boards. The community based health workers allowances were the actual allowances that they were receiving for every visit to a participant and were based on the allowances given by other community based programmes. All costs that are not directly related to treatment were excluded as per the DCP2, (2006).

### 4.8.2 Effectiveness of CBDR

The outcome of each CBDR intervention in terms of remission rates were obtained as follows: The weekly records of each participant drinking habit as given by the CBHW and confirmed by the P.I report were compiled and analyzed for the 6 months period. Those that had not drank alcohol for the past six months (remission group) and those that were still drinking

(relapsed group) were determined. Remission was defined as been abstinent for six months after start of study while any person who had drunk alcohol in the six months of the study was defined as having relapsed.

In addition the ASSIST question 2B was used to determine the drinking pattern. The effectiveness was determined by analyzing the data obtained after 6 months of rehabilitation on the following: Remission rates, relapse, and the dropout rates, number of participants deceased at 6 months, changes in the co morbid psychiatric disorders, changes in financial, social, legal and health problems after 6 months and the number of people reached at 6 months.

### 4.8.3 Method of obtaining cost of IBDR

Cost of IBDR was calculated using the cost of those that went through detoxification before rehabilitation. The cost of rehabilitation was fixed according to the charges of the rehabilitation centre. The cost of detoxification for each person included the daily hospital bed charges, the cost of drugs, syringes, needles and other materials used specifically for detoxification. The number of days a person stayed in hospital and the total visits by the doctor were recorded and confirmed from the discharge invoices and summary. Costs related to investigations were not included in the calculation neither were the costs attributed to treatment of other co morbid disorders. This was to achieve uniformity with the community based group who's cost of laboratory investigations and treatment of any co morbid disorders was not included in the cost calculation. The average cost treatment was then calculated for the twenty one people who went through both institution based detoxification and rehabilitation. The salaries of the staff infrastructure and administrative cost for the institution based intervention were included in the amount charged by the admitting facility. All costs that are not directly related to treatment were excluded as recommended in the guidelines to cost effective analysis (Jamison, et al., 2006).

### 4.8.4 Method of obtaining effectiveness of IBDR

Remission rates, relapse rates and the mortality rate were obtained at six months through a telephone conversation with the spouse, parent or sibling as described under the procedure section earlier. The definition of remission and relapse criteria is as described earlier. The post test status of co morbidity, social, financial, health and legal problems could not be determined on telephone.

### 4.8.5 Collection of Samples of Alcoholic Brews from Field of Study

Samples of alcohol sold in Kangemi study area were purchased for analysis with assistance of one of the rehabilitated participant. Fourteen alcoholic brew samples were collected from field of study for chemical analysis. These were the types commonly used by study participants though some of the participants would use a combination of many brews while others reported using only those which would make them get drank quickly. Three of the samples were illicit brews and only the persons who knew the sites of sale and were known to the sellers could collect the samples.

The collected samples were labeled and taken to the government chemist for ethanol, methanol levels analysis. The illicit brew samples were submitted for analysis by the principal researcher while a public health officer submitted the eleven licit brew samples. This was due to the legal implication involved in handling the illicit brew, in that the PI was permitted to collect and analyze the samples for research purpose without involving the police while the public health officer was required by law to involve the police. The illicit brews were analyzed at a fee while the licit ones were done free of charge by the government chemist.

The chemical analysis was done using gas chromatography. In which a sample of alcohol is injected into the head of the column using a micro syringe. The chemicals in the sample pass in a gas stream at different rates depending on their physical properties. Detection and identification of the constituent chemicals is done electronically. As the chemicals exit the end of the column, they are detected and identified electronically. The beer and wine samples required to be distilled first before injecting into the chromatograph. A carrier gas (nitrogen) sweeps the analyte molecules through the column. The rate at which the molecules progress along the column depends on the strength of adsorption which in turn depends on the type of

molecule and on the stationary phase materials. Different types of molecules have a different rate of progression, and this enables the various constituents of the analyte mixture to be separated as they move along the column at different rates (retention time). Generally, substances are identified (qualitatively) by the order in which they emerge (elute) from the column and by the retention time of the analyte in the column (Pavia, et al., 2006).

## 4.9.0 Ethical Consideration

Consent was obtained from all the participants before joining the study. All participants were aged 18 years and above and legally eligible to consent. A national identification card was used to obtain and confirm age. Participation into the study was voluntary. Consent explanation was given before the client consented to enrolling into the study. All aspects of detoxification including medication, dosage and side effects, right to withdraw at any time during study were explained after which consenting individuals and the witness signed a consent form. Confidentiality was assured at all times as described later. The patient was also informed of the intravenous injections once daily for three days.

All the subjects joining the community based study underwent general physical and mental state examinations. Those found to have severe medical conditions were referred to the doctor for medical treatment at the health centre. If the patient's condition could not be managed at the health centre, further referral along the laid down procedures was done at the Kangemi Health Centre. Patients found to have neuropsychiatric disorders of alcohol abuse were not enrolled for the study but referred to the health centre's psychiatric clinic for treatment. They were free to join the study once treated and improved.

To prevent withdrawal syndrome and related problems like delirium tremens and wernickes encephalopathy, the following drugs were administered prophylactically; vitamins B and C (pabrinex 1&11) intravenously daily for 3 days. This was done at the health centre where there were adequate resuscitation facilities in case of anaphylactic reaction to the drug, diazepam given at night for 5 days and carbamazepine 200mg was given at night for 10 days. These drugs are standard medication used for alcohol detoxification and there was no risk involved except the discomfort of injection.

The psychiatrist prescribed all the drugs and daily reviewed the patients for the first 5 days, thereafter every 2 days until the fourteenth day. This was to enable early detection of complications of alcohol withdrawal and offer management. Referral of all cases to the relevant hospital (as detailed above) that could not be managed at the health centre was done efficiently wherever necessary at any stage of the study. The institution based group did not undergo the examination and detoxification since they were enrolled to the study at the point of entry to rehabilitation.

The information about the subjects remained confidential and individuals unwilling to continue with the rehabilitation were allowed to leave. Permission was obtained from Kenyatta National Hospital Ethical Committee, administration of Kangemi Health Centre, Office of the President through the Ministry of Higher Education and Science and Technology and the administration of the rehabilitation centres.

### 4.9.1 Confidentiality

The individual data obtained from the questionnaires was kept under custody of principal investigator and identified only by use of a serial number. All outcomes had serial number the code of which was held only by the PI No individual information was reported that could be used to identify an individual. Information obtained from the study subjects was unavailable for use during group therapy. This allowed group members to participate in group discussions only on issues they felt comfortable to discuss. In addition the group therapy meetings were voluntary though members were strongly encouraged and advised on the benefits.

The institution based participants were in turn requested for consent to obtain information from next of kin and hospital documents as well.

Although the CBHW were already trained in collecting similar data in the community, retraining was done before the commencement of the study. The main focus of the training was confidentiality and handling of study subjects and information obtained from them. Individuals unwilling to continue with the rehabilitation were allowed to leave and their details remained confidential.

### 4.9.2 Benefits of Study to the Patient

The benefits of the study to the patient included, receiving treatment on outpatient basis at no cost, referral if found to have medical problems, alcohol detoxification within the community, scheduled visits at home and at the clinic and exposure to group therapy and self support social networks

### 4.9.3 Risks

None except pain associated with parenteral injection.

## 4.10.0 Data analysis and result presentation

Data collected was coded, entered and stored in computer. Only the PI had the name related to the code number. At the end of study, data was analyzed using STATA version 10. Descriptive and inferential statistics were performed and results presented in form of tables for quantitative analysis and narratives for qualitative analysis. A p-value of less than 0.05 was considered to be statistically significant.

### 4.10.1 AUDIT and ASSIST analysis

The AUDIT instrument has 10 items alcohol behavioural outcomes composed of hazardous drinking, alcohol dependence and alcohol related harm. The items are scored on a scale of 0 to 4 and linearly transformed to 0 to 100 score scales. The sub-scales score are linearised as

$$S = \frac{(RS)}{Range} \times 100$$

where RS is the raw score obtained by taking the sum of the items and range is the difference between the maximum possible value of RS and the minimum possible value.

The alcohol associated problems such as social, health, legal and financial (obtained in data from the ASSIST instrument) were linearised in the same way to generate overall alcohol

problem score on a scale of 0 to 100. The final score were compared between institution and community using t-test for comparing average scores.

### 4.10.2 Cost effectiveness analysis

A cost effectiveness analysis involved four stages or steps. Firstly, the expected impact was identified as the proportion of the alcohol takers who stopped six months after each intervention (CBDR and IBDR). Secondly, the total resource costs of the two programmes were assessed or determined. Thirdly, the cost per unit output and outcome are assessed, through the simple division of costs by outcomes (number of those stopped drinking). Finally the results were then expressed as $ per life time quitter.

# Chapter Five

## 5.0 Results and Discussion

The results on every objective are presented below. Each of the objectives is discussed separately to enable easy comprehension by the reader. The overall discussion of the major findings is discussed in chapter six. The following asterisk(s) have used to indicate the statistical significance for all results in this chapter.

*** Not statistically significant**

**** Statistically significant**

***** Highly statistically significant**

## 5.1 Socio demographic characteristics

A total 188 participants underwent community based detoxification, 174 (92.6%) completed the 3 intravenous Pabrinex injections, 13 (6.9%) received two and one (0.5%) received only one of the same injection and failed to complete the injections. The institution group had 21 (23.9%) who underwent detoxification before admission to the rehabilitation centres while the remaining 76.1% joined the rehabilitation directly.

The community and the institution groups had certain similarities as well as differences in their socio demographic characteristics. The similarities in the two groups included, the male predominance, the young age of the participants with the majority in both groups being 40years of age, predominantly Christian in religion (with over 90% of participants in each group being Christian) and the mean number of children that the participants had. There were no statistical differences in the ages, religion, sex, marital status and mean number of children between the two study groups.

There were statistically significant differences in the education level, type of occupation and monthly income. The institution group had a better level of education with 41.2% of the institution group having attained University or college education as compared to 11.1% of the community based group. Consequently a statistically significant greater percentage (39.7%) of

the institution based group was employed as compared to 21.3% of the community group who were employed. The community based group had 27.7% of the participants engaged in business which were of small scale and 20.2 % were casual labourers as opposed to 2.3% of the institution based group who were casual labourers.

The institution based group participants had a statistically higher mean income than the community based group. While 29.8% of the community group had no income and only 9.1% had an income of more than 429 USD, all the institution group participants had a steady monthly income with majority (59%) earning more than 429 USD per month. The socio demographic results are summarized in table 1a and 1b.

## Table 1(a): Socio demographic characteristics

| | Community group (n188) | | Institution group (n88) | | |
|---|---|---|---|---|---|
| | Number | % | Number | % | |
| **Sex** | | | | | |
| Male | 172 | 91.5 | 87 | 98.9 | $X^2 = 1.413$ |
| Female | 16 | 8.5 | 1 | 1.1 | df = 3 |
| Total | 188 | 100 | 88 | 100 | P = 0.703* |
| **Occupation** | | | | | |
| Unemployed | 42 | 22.3 | 33 | 7.5 | $X^2 = 20.380$ |
| Business | 52 | 27.7 | 18 | 20.5 | df = 3 |
| Casual | 38 | 20.2 | 2 | 2.3 | P = 0.000*** |
| Employed | 40 | 21.3 | 35 | 9.7 | |
| Others | 16 | 8.5 | 0 | 0 | |
| Total | 188 | 100 | 88 | 100 | |
| **Marital status** | | | | | |
| Single | 68 | 38.9 | 45 | 51.1 | $X^2 = 13.548$ |
| Married | 91 | 51.9 | 30 | 34.1 | df = 4 |
| Separated/Divorced | 15 | 8.6 | 10 | 11.4 | P = 0.09* |
| Others | 1 | .6 | 3 | 3.4 | |
| Total | 175 | 100 | 88 | 100 | |
| **Education level** | | | | | |
| Primary | 45 | 27.8 | 0 | 0 | $X^2 = 63.270$ |
| Secondary | 99 | 61.1 | 40 | 58.8 | df = 2 |
| University/ college | 18 | 11.1 | 28 | 41.2 | P = 0.000*** |
| Total | 162 | 100 | 68 | 100 | |
| **Religion** | | | | | |
| Christians | 163 | 93.2 | 45 | 97.7 | $X^2 = 7.061$ |
| Muslim | 3 | 1.7 | 0 | 0 | df = 3 |
| Others | 9 | 5.1 | 1 | 2.3 | P = 0.70* |
| Total | 175 | 100 | 44 | 100 | |

(Primary education is preliminary education done for the first 8 years after kindergarten and Secondary education is four years of high school education after completing primary school. University/ College are degree or vocational diploma education).

**Table 1(b): Socio demographic characteristics**

| | Community based group (n188) | | Institution based group (88) | | |
|---|---|---|---|---|---|
| | Number | % | Number | % | |
| **Age in years** | | | | | |
| < 30 | 62 | 41.3 | 31 | 47.7 | $X^2 = 1.413$ |
| 30- 39 | 64 | 42.7 | 22 | 33.8 | df = 3 |
| 40+ | 24 | 16 | 12 | 18.5 | P = 0.703* |
| Total | 150 | 100 | 65 | 100 | |
| **Monthly income** | | | | | |
| | 46 | 29.5 | 0 | 0.0 | $X^2 = 50.178$ |
| <71.4 | 50 | 32.2 | 4 | 7.7 | df = 5 |
| 71.4 -142.9 | 33 | 21.1 | 8 | 15.3 | P = 0.000*** |
| 143 -414 | 12 | 7.6 | 9 | 18 | |
| >=429 | 15 | 9.6 | 30 | 59 | |
| Total | 156 | 100 | 51 | 100 | |
| **Participants' number of children** | | | | | |
| 0 | 54 | 34.9 | 20 | 44.4 | $X^2 = 1.067$ |
| 1-3 | 86 | 54 | 22 | 50 | df = 2 |
| 4+ | 16 | 10.3 | 3 | 5.6 | P = 0.587* |
| Total | 156 | 100 | 45 | 100 | |

The mean age for the community based group was 31.9 years and that of institution based group was 31.1years.

## 5.2 Age at which participants started taking alcohol

Participants of both the community and institution based interventions began using alcohol at an early age with, 60.5 % of the community group beginning to drink alcohol before the age of 18years and 32.4% of the institution group beginning before the same age. Overall, 92.9% of community group and institution group began drinking by the age of 25years. The minimum age of starting to use alcohol was 5years for community based group and 11 years for

institution based group. There was however no statistically significant difference in the age of onset of alcohol use in the two groups. The results are summarized in table 2.

**Table 2: Age at which participants started using alcohol**

| | Community group (n188) | | Institution group (n88) | |
|---|---|---|---|---|
| | Number | % | Number | % |
| Age in years | | | | |
| <18 | 144 | 92.9 | 77 | 92.8 |
| 18-25 | 10 | 6.5 | 6 | 7.2 |
| >25 | 1 | 0.6 | 0 | 0 |
| Total | 155 | 100 | 83 | 100 |

$X^2 = 0.584$

df= 2

P value= 0.747*

## 5.3 AUDIT Scores

The mean AUDIT score for the community group was 28.6 for males and 26.6 for females. The results are shown in table 3.

**Table 3: Community group AUDIT Scores**

| Sex | Audit Score | Mean | n | % | Std. Deviation |
|---|---|---|---|---|---|
| Male | >=15 | 28.6395 | 172 | 91.5 | 7.09734 |
| Female | >=13 | 26.6250 | 16 | 8.5 | 8.05709 |
| Total | | 28.4681 | 188 | 100 | 7.18242 |

In the institution group, the only female scored 35 on the AUDIT scale. The mean AUDIT score for the male participants was 15.8.

## 5.4 Pattern of alcohol use

There was a statistically significant higher level of alcohol use by the community based as compared to institution based group at intake. The results are shown in table 4.

**Table 4: Alcohol use by the community and institution based groups at intake**

| | Institution group (88) %( Number) | Community group (188) %( Number) | Total (276) %( Number) |
|---|---|---|---|
| **Alcohol use** | | | |
| Never | 0 (0) | 0(0) | 0(0) |
| Once or twice | 2.3(5) | 6(13) | 8.3% (n18) |
| Monthly | 5.5(12) | 6.5(14) | 2.0% (n26) |
| Weekly | 5.1(11) | 4.1(9) | 9.2% (n20) |
| Daily | 8.9(41) | 51.6(112) | 70.5% (n153) |
| Total | 31.8(69) | 68.2(148) | 100% (n217) |

$X^2 = 28.875$

df = 4

P value = 0.000***

## 5.5 Symptoms of Alcohol Dependence, hazardous drinking, harmful use and alcohol related problems

The community group had statistically significantly higher levels of hazardous drinking alcohol (p value = 0.0001) and dependence (p value = 0.0004) when compared to the institution group. However there were no statistically significant differences in the levels of harmful alcohol use (0.0975) and alcohol related problems (0.3204) for the community based and institution- based groups. The results are shown on table 5.

Table 5: **Levels of alcohol dependence, hazardous drinking, harmful drinking and alcohol related problems in institution as compared to community based group**

| | Institution Mean (SD) | Community Mean (SD)) | p-value |
|---|---|---|---|
| Hazardous | 69.3 (28.4) | 83.2 (24.0) | 0.0001*** |
| Dependence | 62.6 (31.7) | 76.0 (27.2) | 0.0004*** |
| Harmful drinking | 68.6 (28.8) | 74.5 (27.2) | 0.0975* |
| Alcohol problem | 21.4 (25.0) | 18.4 (22.0) | 0.3204* |

(The symptoms of alcohol dependence were obtained by analyzing question 4-6 of the AUDIT questionnaire; those of hazardous drinking were analyzed from question 2-3 while those of harmful drinking were analyzed from questions 7-10 of the same scale. Further analysis on question 4b of the ASSIST questionnaire was done to obtain the alcohol related problems (social, health, financial and legal).

## 5.6 Discussion

### Socio Demographic Factors

The socio demographic characteristics of the community and the institution group as regards to education, income and occupation are a true reflection of their backgrounds. While the community based group was from a poor socio economic background the institution group had a better socio economic status. This was reflected in the results that showed statistically significant differences in the education level, monthly income and the type of occupation.

The community based and institution based group participants were generally young with the majority in both groups being below 40 years of age with no statistically significant difference between the ages of the two groups. This finding is consistent with that by Cosar, et al., 1996 and Hasin, et al., 2007 who found that alcohol dependence was more common in the 16-39 years compared to other age groups.

In addition both the participants of the community based and institution based group started using alcohol at an early age with no significant differences between the two groups in their age of onset for alcohol use. In spite the legal age of alcohol use being 18 years, 92.9% of the participants of the study started using alcohol before the age of 18 years. The early use of alcohol is a worrisome situation.

In Kenya most of students complete secondary school education at the age of 18 years and many qualify to join the university or colleges yet cannot due to various factors especially lack of finances.

Underage drinking is associated with alterations in brain cognitive impairment as well as further escalation of drinking and learning impairment that affect academic and occupational achievement (Spear, 2002). Additional studies have shown that adolescents who began drinking at an earlier age had a proportionally small hippocampus volumes compared with those that began later. This may explain the poor academic performance especially in the community based group.

While 41.2% of the institution based group had university or college education only 11.1% of the community based group had a degree or college education. This gets consequently reflected in the occupation of the 2 groups. The 20.2% of the community based group were casual workers and 27.7% were small scale business persons. Casual labour implies that the person move from place to place looking for manual jobs of any kind for which they are lowly paid. In spite of the majority of both the community based and institution based group participants beginning to use alcohol early, the institution group had a statistically higher income and better quality of occupation compared to the community based group. This may be explained by possibly rich background of the institution based group who may have received support from the relatives. The institution based group was selected from a group that was able to afford costly institution based treatment, implying that they were likely to have a better socio economic background.

An additional factor that may have contributed to the lower income, education and poorer occupation status is the level of alcohol dependence and hazardous drinking. AUDIT mean score was higher in the community based than institution based male participants. The

community based group had a statistically significant level of hazardous drinking (P< 0.0001) and alcohol dependence (p value 0.0004) than the institution based group.

The higher levels of alcohol dependence among the community based group can be attributed partly to the low socio economic status of the group. This finding is supported by a study by Morris, et al., (2006) that showed that alcohol consumption in Kenya is higher in poor communities where potent home brewed alcohol is cheap and readily available. Similarly, Hasin, et al., 2007 in their study, which showed that alcohol dependence, was significantly associated with lower income.

Other factors that may explain the higher alcohol dependence in the community based group are the low income and education level as explained earlier. Poor education has been associated with a higher risk of alcohol dependence. This finding is consistent with that of Gulman, et al., (2008) who found that individuals without college /university education had higher risks for alcohol dependence than individuals with a college degree and more.

There was however no statistically significant difference in the two groups in the levels of harmful drinking and also alcohol related problems. This implies that the harmful effects and problems related to alcohol use are likely to affect alcohol users irrespective of the background.

The majority of the participants in the community and institution based groups were men. This finding is consistent with those of other studies that men are more likely to use alcohol and other substances of abuse (Kuria, 1996; Ndetei, 1997) and that alcohol dependence is significantly higher in males than females (Hasin, et al., 2007; Peltzer, et al., 2006; Shlik., 1997).

The African society is traditionally more receptive to use of alcohol by males than females on alcohol dependence, who are stigmatized. Globally, alcohol abstention rates are higher in females than males. Consequently, the set up of treatment centres in Kenya are generally meant to meet the needs of adult men with all the facilities having more male beds than females or having entirely male admissions. Though the number of beds for females is few, they are rarely filled to capacity. Special treatment settings such as outpatient treatment may in some cases not meet the needs of some female patients. One feasible reason is that female patients more often have an alcoholic spouse compared to male participants (Bottlender M, and Soyka M., 2005).

Other possible reasons, are that the women avoid stigmatization by keeping away from treatment centres or as explained by some of the women who declined treatment in the current study, is that alcohol use enables them to receive money from drunken men in exchange of sex. It is therefore important that health workers dealing with prevention of HIV/AIDS would address the subject of alcohol use and its contribution to the spread of HIV.

The majority of participants in both groups were of the Christian faith. This may reflect the religious background of the nation where the majorities are Christian. The role of religion in alcohol prevention and treatment as studied by Cosar, et al., (1996) among the Muslim dominated study did not show any protective value in preventing alcohol consumption. In the current study, there were no differences in religion in those that relapsed or remained abstinent after six months. Studies report that faith-based community organizations have long provided support to individuals in need (Carlson, et al., 1994; Maton, 1987; Maton, 2002; Maton and Pargament, 1987), by giving a network supportive of recovery, particularly for individuals who have substance-using friends.

Most of the alcohol dependent persons in the current study would benefit from after treatment support system to help them remain abstinent and the role of faith based organizations would be useful.

**Conclusion**

The similarities and differences in the socio economic factors of the community based and institution based groups are a true reflection of their socio economic backgrounds.

## 5.7.0 Objectives 1 and 2: To determine the effectiveness of community based and institution based detoxification and rehabilitation of alcohol dependent persons

### 5.7.1 Remission and relapse rates

At the end of six months 130 (69.1%) out of the 188 community based participants were reached by the PI and the community health worker while 57 (30.3%) could not be reached mainly because they had moved from their usual residence and 1 (0.5%) had died at the fourth month of the study from undisclosed medical condition.

Seventy four (56.9%) out of the 130 had not used alcohol for the entire six months as per the follow up reports by both the PI and the community health worker. This remission rate was consistent with that obtained by the analyses of question 3b of the ASSIST questionnaire filled at the end of six months (the question enquires on alcohol use in the last 3 months), which showed that 56.6% of the 130 participants had not drank alcohol at all for the past three months. A total of 35.9% were drinking daily while 7.8% were drinking, but not on a daily basis.

The pattern of alcohol drinking for the community group at the beginning of study was compared with that at six months and there was a statistically significant (p value = 0.000) reduction in the use of alcohol. Regarding the institution based group at the end of six months, the drinking pattern of 79 (89.8%) out of 88 institution based participants were obtained on telephone. Out of the 79 contacted, 44.3% (35) were in remission. Six of them could not be reached, 2(6.8%) refused to divulge information and 1(1.1%) was reported to have died from alcohol related liver problem. There was a statistically significant difference in the pattern of alcohol use at intake with the community based group using alcohol more often than the institution based group. The results are shown in tables 6 and 7.

**Table 6: Remission and Relapse Rate (Community based group)**

| | Community at intake (n188) | | Community (6mth) (n130) | |
|---|---|---|---|---|
| | **Number** | **%** | **Number** | **%** |
| Alcohol use | | | | |
| No | 0 | 0 | 74 | 56.9 |
| Yes | 188 | 100 | 56 | 43.8 |
| Total | 188 | 100 | 130 | 100 |

$X^2 = 46.687$,

(df = 4)

P value = 0.000***

**Table 7: Remission and Relapse Rate (Institution Based Groups)**

| | Institution at intake (n88) | | Institution at 6mths (n79) | |
|---|---|---|---|---|
| | **Number** | **%** | **Number** | **%** |
| Alcohol use | | | | |
| No | 0 | 0 | 35 | 44.3 |
| Yes | 88 | 100 | 44 | 55.7 |
| Total | 88 | 100 | 79 | 100 |

Pre and post tests not similar and $X^2$ not applicable

## 5.8 Craving for alcohol

There was a statistically significant difference (p value =0.000) in alcohol craving at beginning of study (intake) and after 6 months of treatment. The results are shown in table 9. The craving for the institution group was determined only at intake and was found to be at significantly lower level than that of the community group at intake (p value=0.017). The results are shown in tables 8 and 9.

**Table 8: Alcohol craving in the Community based group at intake and at 6months**

| | Community at intake (188) | | Community at six months (130) | |
|---|---|---|---|---|
| | Number | % | Number | % |
| No | 3 | 2 | 36 | 58 |
| Yes | 145 | 98 | 26 | 42 |
| Total | 148 | 100 | 62 | 100 |

$X^2 = 86.538$

df = 4

P value = 0.000***

**Table 9: Craving for alcohol for institution and community based group**

| | | Never | Once/Twice | Monthly | Weekly | Daily | Total |
|---|---|---|---|---|---|---|---|
| **Institution** | | | | | | | |
| | Count | 3 | 2 | 6 | 14 | 45 | 70 |
| | % of total | 1.3 | 0.9 | 2.6 | 6.1 | 19.5 | 30.3 |
| **Community** | | | | | | | |
| | Count | 2 | 14 | 9 | 13 | 123 | 161 |
| | % of total | 0.9 | 6.1 | 3.9 | 5.6 | 53.2 | 69.7 |
| **Total Count** | | | | | | | |
| | | 5 | 16 | 15 | 27 | 16 | 231 |
| | % of total | 2.2 | 6.9 | 6.5 | 11.7 | 72.7 | 100 |

$X^{2=} = 12.077$

df = 4

P value = 0.017**

## 5.9 Symptoms Experienced by the community based participants during treatment

The various physical and psychological symptoms as reported by the community based health workers and PI were analyzed. The most commonly reported symptoms were insomnia, headache, and sadness, being easily annoyed and poor memory in that order. Two participants reported that they had a convulsion on the second day. One of them admitted that he had failed to take both the carbamazepine and diazepam medication as advised on the first day of detoxification. The most common symptoms were low mood, insomnia and feeling withdrawn. Hopelessness, nausea, poor memory and restlessness were experienced at the same frequency. Suicidal thoughts were present in 4.9% while 2 participants reported convulsions. One participant experienced delirium tremens that necessitated admission to hospital for 3 days. The results are shown in table 10.

**Table 10: Symptoms experienced by community group participants**

| Symptoms | (n188) | |
|---|---|---|
| | **CBHW report** | **PI report** |
| | Yes (%) | Yes % |
| Tremors | 1.8 (n7) | 4.9 (n13) |
| Headache | 22.6 (42) | 15.8 (n 27) |
| Vomiting | 10.1(n39) | 6.4(n17) |
| Nausea | 4.4 (n17) | 8.3 (n22) |
| Insomnia | 6.8(n26) | 12(n32) |
| Poor memory | 19.4(n74) | 8.3(n22) |
| Visual hallucinations | 2.1(n8) | 3.8(n10) |
| Easily annoyed | 19.8(n76) | 5.6(15) |
| Convulsions | 0.5(n2) | 0.8(n2) |
| Confusion | 15.1(n58) | 7.2(n19) |
| Sadness | 20.1(n77 | _ |
| Restlessness | _ | 8.3(22) |
| Feeling withdrawn | _ | 11.3(n30) |
| Suicidal thoughts | _ | 4.9 (n13) |
| Hopelessness) | _ | 8.3(n22) |
| Delirium tremens | _ | 0.4(n1) |
| Low mood | _ | 15.8(42) |
| Loss of appetite | - | 0.2 |
| Pain | - | 1 |
| Drowsiness (daytime) | - | 0.2 |
| Fear, dreams, nightmares | - | 0.5 |

## 5.10 Factors associated with remission and relapse (community based group)

Tables 11 and 12 shows the predictive value of different factors for abstinence and remission in the community based group

There were no differences in the socio demographic and other characteristics in the group that remained abstinent and that which relapsed except on three factors namely, alcohol drinking pattern at intake (p value = **0.046)**, craving for alcohol at intake ( p value = **0.045)** and the age of onset of alcohol drinking (p value = **0.010** ). Further there was a statistically significant predictive value in the mean score of alcohol related problems in the community based group (health, social, financial and legal).

## Table 11: Odds ratio and P value for factors associated with remission and relapse (community group)

### Drinking Status after 6 months

| | Not Stopped | Stopped | % of total | Number | Odds Ratio | Std. Error | P-value | 95% | C.I |
|---|---|---|---|---|---|---|---|---|---|
| Male | 41.9 | 58.1 | 91.4 | 170 | | | | | |
| Female | 50.0 | 50.0 | 8.6 | 16 | 0.72 | 0.44 | 0.589* | 0.22 | 2.37 |
| Total | | | 100 | 186 | | | | | |
| **Marital Status** | | | | | | | | | |
| Single | 43.6 | 56.4 | 40.1 | 73 | | | | | |
| Married | 41.0 | 59.0 | 51.1 | 93 | 1.11 | 0.54 | 0.773* | 0.61 | 2.93 |
| | 60.0 | 40.0 | 8.8 | 16 | 0.52 | 0.27 | 0.345* | 0.20 | 1.46 |
| Total | | | 100 | 182 | | | | | |
| **Religion** | | | | | | | | | |
| Protestant | 40.3 | 59.7 | 56.6 | 103 | | | | | |
| Catholic | 50.0 | 50.0 | 36.8 | 67 | 0.67 | 0.26 | 0.307* | 0.32 | 1.44 |
| Muslim/Others | 40.0 | 60.0 | 6.6 | 12 | 1.01 | 0.70 | 0.987* | 0.26 | 3.90 |
| Total | | | 100 | 182 | | | | | |
| **Total number of children** | | | | | | | | | |
| No Child | 40.7 | 59.3 | 26.5 | 42 | | | | | |
| One | 45.5 | 54.6 | 18.4 | 29 | 0.83 | 0.48 | 0.740* | 0.26 | 2.57 |
| Two | 56.3 | 43.8 | 28.5 | 45 | 0.53 | 0.28 | 0.237* | 0.19 | 1.51 |
| Three | 13.3 | 86.7 | 15.2 | 24 | 4.47 | 3.82 | 0.080* | 0.84 | 23.86 |
| Four and more | 50.0 | 50.0 | 11.4 | 18 | 0.69 | 0.51 | 0.614* | 0.16 | 2.95 |
| Total | | | 100 | 158 | | | | | |
| **Drinking pattern at intake** | | | | | | | | | |
| Not everyday | 26.7 | 73.3 | 23.6 | 38 | | | | | |
| Daily or almost daily | 48.2 | 51.9 | 76.4 | 123 | 0.39 | 0.18 | **0.046**** | 0.16 | 0.98 |
| Total | | | 100 | 161 | | | | | |
| **Craving for alcohol at intake** | | | | | | | | | |
| Not everyday | 23.1 | 76.9 | 24.3 | 36 | | | | | |
| Daily or almost daily | 46.0 | 54.1 | 75.7 | 112 | 0.35 | 0.18 | **0.045**** | 0.13 | 0.98 |
| Total | | | 100 | 148 | | | | | |
| **Change in Co morbidities** | | | | | | | | | |
| Decrease | 44.1 | 55.9 | 78.5 | 102 | | | | | |
| No change | 31.3 | 68.8 | 12.3 | 16 | 1.74 | 1.00 | 0.337* | 0.56 | 5.36 |
| Increase | 50.0 | 50.0 | 9.2 | 12 | 0.79 | 0.48 | 0.699* | 0.24 | 2.61 |
| Total | | | 100 | 130 | | | | | |
| **Age started drinking alcohol** | | | | | | | | | |
| Aged above 18 | 56.0 | 44.0 | 46.7 | 72 | | | | | |
| Aged 18 and below | 31.0 | 69.0 | 53.3 | 82 | 2.83 | 1.14 | **0.010**** | 1.29 | 6.22 |
| Total | | | 101 | 154 | | | | | |

Table 12: **Other factors associated with remission and relapse (community group)**

| | Drinking at 6months | | |
|---|---|---|---|
| | **Not Stopped** | **Stopped** | **P value** |
| Average age | 31.7 | 31.7 | 0.9928* |
| Hazardous drinking (mean score) | 84.2 | 81.0 | 0.3883* |
| Alcohol dependence (mean score) | 74.9 | 78.1 | 0.4547* |
| Harmful drinking (mean score) | 76.1 | 72.0 | 0.3348* |
| Alcohol related problem (mean score) | 16.4 | 23.3 | 0.0450** |

## 5.11.0 Factors associated with remission and relapse (institution based group)

Table 13 shows the values of different factors in predicting remission or relapse. There were no statistically significant differences between the community based and institution based group on any of the factors.

## Table 13: Odds ratio and P value for factors associated with Remission and relapse (institution group)

| | Drinking Status after 6 months | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Not Stopped | Stopped | % of total | n | Odds Ratio | Std.Error | P-value | 95% | C.I |
| **Sex** | | | | | | | | | |
| Male | 40.9 | 59.1 | 94.1 | 84 | 5.79 | 6.63 | 0.125* | 0.62 | 54.52 |
| Female | 80.0 | 20.0 | 5.9 | 1 | | | | | |
| *Total* | | | 100 | 85 | | | | | |
| **Marital status** | | | | | | | | | |
| Single | 48.9 | 51.1 | 60.5 | 52 | | | | | |
| Married | 39.1 | 60.9 | 30.2 | 26 | 0.67 | 0.35 | 0.440* | 0.24 | 1.85 |
| Separated/Divorced | 28.6 | 71.4 | 9.3 | 8 | 0.42 | 0.37 | 0.324* | 0.07 | 2.37 |
| *Total* | | | 100 | 86 | | | | | |
| **Religion** | | | | | | | | | |
| Protestant | 38.1 | 61.9 | 52.8 | 45 | | | | | |
| Catholic | 53.6 | 46.4 | 38.8 | 33 | 1.88 | 0.93 | 0.204* | 0.71 | 4.94 |
| Muslim/Others | 50.0 | 50.0 | 8.2 | 7 | 1.63 | 1.42 | 0.579* | 0.29 | 9.05 |
| *Total* | | | 100 | 85 | | | | | |
| **Total number of children** | | | | | | | | | |
| No Child | 33.3 | 66.7 | 29.6 | 13 | | | | | |
| One | 75.0 | 25.0 | 11.4 | 5 | 6.00 | 7.84 | 0.170* | 0.46 | 77.75 |
| Two | 50.0 | 50.0 | 25.0 | 11 | 2.00 | 1.87 | 0.459* | 0.32 | 12.51 |
| Three | 25.0 | 75.0 | 18.2 | 8 | 0.67 | 0.68 | 0.691* | 0.09 | 4.93 |
| Four and more | 28.6 | 71.4 | 15.8 | 7 | 0.80 | 0.83 | 0.830* | 0.10 | 6.10 |
| *Total* | | | 100 | 44 | | | | | |
| **Drinking pattern at intake** | | | | | | | | | |
| Not everyday | 39.1 | 60.9 | 34.8 | 24 | | | | | |
| Daily or almost daily | 53.8 | 46.2 | 65.2 | 45 | 1.81 | 0.97 | 0.265* | 0.64 | 5.17 |
| *Total* | | | 100 | 69 | | | | | |
| **Craving for alcohol at intake** | | | | | | | | | |
| Not everyday | 38.5 | 61.5 | 41.2 | 28 | | | | | |
| Daily or almost daily | 47.2 | 52.8 | 58.8 | 40 | 1.43 | 0.75 | 0.493* | 0.51 | 3.99 |
| *Total* | | | 100 | 68 | | | | | |
| **Age started drinking alcohol** | | | | | | | | | |
| Aged above 18 | 32.0 | 68.0 | 35.4 | 29 | | | | | |
| Aged 18 and below | 51.0 | 49 | 64.6 | 53 | 2.21 | 1.14 | 0.123* | 0.81 | 6.08 |
| *Total* | | | 100 | 82 | | | | | |

### 5.11.1 Reasons for alcohol use

The various reasons given by both the community based group and institution based group for drinking alcohol are shown in table 14. There was no statistically significant difference in the reasons for use except on curiosity, peer pressure and, influence by friends, with the community based participants significantly higher responses on these three items.

## Table 14: Reason for drinking

| | Institution | | Community | | |
|---|---|---|---|---|---|
| | Response | % (n) | % (n) | Total | |
| Peer pressure | | | | | |
| | Yes | 15.1% (n38) | 41.3% (n104) | 56.3 %( n142) | $X^2$= 8.673 |
| | No | 19.4% (n49) | 24.2%(n61) | 43.7% (n 110) | df= 1 |
| | Total | 34.5% (n87) | 65.5% (n165) | 100% (n252) | **p value= 0.003**** |
| To avoid withdrawal effects | | | | | |
| | Yes | 16.7% (n 42) | 37.7% (n95) | 54.4% (n137) | $X^2$=1.986 |
| | No | 17.9% (n 45) | 27.8% (n70) | 45.6% (n115) | df=1 |
| | Total | 34.5% (n87) | 65.5% (n 165) | 100% (n 252) | p value=0.159* |
| Gives me company with friends | | | | | |
| | Yes | 13.1% (n 33) | 27% (n66) | 40.1% (n101) | $X^2$=0.255* |
| | No | 21.4% (n 54) | 38.5% (97) | 59.9% (n 151) | df=1 |
| | Total | 34.5% (n 87) | 65.5% (n165) | 65.5% (n 252) | p value= 0.613* |
| Helps me ran away from my problems | | | | | |
| | Yes | 9.9 %( n25) | 25.8% (65) | 35.7% (90) | $X^2$=2.819 |
| | No | 24.6 %( n 62) | 39.7% (100) | 64.3% (n 162) | df=1 |
| | Total | 34.5% (87) | 65.5% (n 165) | 100% (n 252%) | p value=0.093* |
| Influenced by my friends | | | | | |
| | Yes | 4.8% (12) | 25.0% (n 63) | 29.8% (n 75) | $X^2$=16.209 |
| | No | 29.8% (n75) | 40.5% (n 102) | 70.2% (177) | df=1 |
| | Total | 34.5% (n 87) | 65.5% (n 165) | 100% (n 252) | p value=0.000*** |
| Keeps away loneliness and sadness | | | | | |
| | Yes | 13.5% (n 34) | 23.4% (n 59) | 36.9% (n 93) | $X^2$=0.270 |
| | No | 21% (n 53) | 42.1% (n 106) | 63.1% (n159) | df=1 |
| | Total | 34.5% (n 87) | 65.5% (n 165) | 65.5 %( n252) | p value= 0.603* |
| The drugs are easily available | | | | | |
| | Yes | 9.9% (n 25) | 18.3% (n 46) | 28.2% (n71) | $X^2$=0.21 |
| | No | 24.6% (n 62) | 47.2% (n 119) | 71.8% (n181) | df=1 |
| | Total | 34.5% (n 87) | 65.5% (n 165) | 100% (252) | p value=0.886* |
| Believe there is nothing wrong with using alcohol | | | | | |
| | Yes | 4% (n10) | 14.3% (n36) | 18.3% (n 18.3%) | $X^2$= 4.153 |
| | No | 30.7% (77) | 51% (n 161) | 81.7% (n 205) | df=1 |
| | Total | 34.7% (n 87) | 65.3% (n 164) | 100% (n 251) | p value= 0.042** |
| Was curious to find out the effect of drugs | | | | | |
| | Yes | 9.9% (n 25) | 11.1% (28) | 21% (n 53) | $X^2$= 4.748 |
| | No | 24.6% (n 62) | 54.4% (n 137) | 79% (n 199) | df=1 |
| | Total | 34.5% (n 87) | 65.5% (n 165) | 100% (n252) | p value=0.02** |
| Poor parentage | | | | | |
| | Yes | 5.2 %( n13) | 9.2% (n23) | 14.3 %( n36) | $X^2$=0.064 |
| | No | 29.1 %( n73) | 56.6% (n142) | 85.7 %( n215) | df=1 |
| | Total | 34.3% (86) | 65.7% (n165 | 100% (n251) | p value=0.801* |

## 5.12 Discussion of objective 1

The results on the effectiveness of the community based and institution based detoxification and rehabilitation should be viewed with six caveats in mind. This is because there were differences in the method of assessing the institution and the community based groups that make it difficult to firmly compare the effectiveness of the community based and institution based interventions.

Firstly, while the community based group was followed up weekly for six months by both the principle investigator and the CBHW, the institutional group was only contacted at intake and at six months. The institution group remained in a protected environment for 3 months after which they were discharged to their homes in various parts of the country. The P.I considered it appropriate not to do anything that would enhance the outcome of the institutional management.

Secondly the post-test for the community and institution group differed. While the post-test interview for the community group was done in a face-to-face interview, the institution group was interviewed on telephone to family members. The differences weaken the conclusion on the comparison of the study though information obtained by telephone interviews and in-person interviews is generally considered comparable (Cook, et al., 2005(b)).

Thirdly the post test instruments (at six months) were different. While the ASISST and CIDI were used at six months for the community based group, the telephone interview questionnaire was used for institution based group at six months.

Fourthly the pre-test (at intake) were administered at different points (temporally) for the two groups. The pre-tests for the community based group were done just before detoxification for all the participants. The institution based group on the other hand had 2 categories of people, those that had not undergone detoxification and those that had undergone detoxification before entering the rehabilitation centre. The 23.9% of the institution group who under went detoxification received pre-test after detoxification. This implies that some of the institution based participants received pre-test before commencing treatment while others began after detoxification.

Fifth, there was no randomized assignment to either the community based intervention or the institution based intervention.

Sixth, the testing was not blind which could have resulted to placebo effect (subjectivity of the participants) since the subjects had been explained the details of the study process. This awareness has been known to influence the behaviour of participants.

In spite of these caveats it is important to have in mind the focus of the study. The study focused on cost effectiveness of two types of interventions and not two groups of people with different socio economic patterns.

There were important and novel findings especially in the analysis of the community based data. There is no previous local study in Kenya neither is there any documented for the rest of East Africa on the same.

Despite the caveats it can be concluded that community based treatment was safe and feasible. A total of 69.1% of the community based group were followed for six months after detoxification, with 56.9% of this remaining abstinent for the six months period. This 69.1% is higher than the 44.3% (n 79) of the institution based group participants reached on phone at six months. Remission rate for the community based group is consistent with that found by Mundle, et al., 2001), while that of the institution based group compares with the 20- 50% rate reported in typically treated samples (Miller, et al., 2001; Monahan, et al., 1996). The current findings confirms that short and medium term outcome in outpatient treatment programme can be as effective as inpatient or combined inpatient/ outpatient treatment at least for some patients with good social integration (Mundle, et al., 2001).

The translation of the community based group into a self-help group at the fourth month of the study provided the participants with a social support group, a source of income as well as providing use for their idle time. These may explain the finding that though the community based group had statistically significant higher levels of alcohol dependence and hazardous drinking than the institution based group, their remission rate was higher than that of the institution group. This is consistent with reports that beneficial effects of self help groups like AA have been attributed in part to the replacement of participants' social network of drinking

friends with a fellowship who can provide motivation and support for maintaining abstinence (Cook, et al., 1998).

In addition the community based had access to the principal researcher for the entire six months, unlike the institution based group who were discharged from the institution after three months. After treatment care is important in sustaining remission in treated alcohol dependent patients. Studies report that more social resources, especially supportive relationships with family members and friends are associated with remission (Blomqvist, et al., 1999, Tuchfeld, et al., 1981, Tucker, et al., 2002).

One advantage of community based over institution based detoxification and rehabilitation is that the alcohol dependent person recovers within the community. This enables them to solve the problems related to relapse early in the treatment and to develop coping or alterative mechanism to remain in remission. The individual also begins to tackle the various social, health, legal and financial issues early in their treatment and at the end of six months. Given good social support systems; they are likely to have dealt with their problems. On the contrary, the institution based treatment removes the individual temporarily from real life situations and by the time they return after the minimum 3 months stay at the rehabilitation centre, they are likely to find the problems unchanged leading to relapse. The institution based treatment on the other hand offers 90 days protected period. No participant left the rehabilitation centre before the compulsory three-month stay recommended by the institution.

Despite the fact that the community based group had a higher mean AUDIT score (a statistically higher alcohol dependence and hazardous drinking) than the institution based group, their remission rate was higher than that of the institution based group. This is not consistent with the finding by Project Match, (1997) that reported little differences (in outcomes) between day hospital and out patient treatment except on one attribute, psychiatric severity (Project Match, 1997).

The comprehensive follow up of the community based participants and involvement in a self help group may have contributed to a better treatment outcome in spite of the greater severity of alcohol dependence in the community based group. The self-help group provided the social and economic resources that were lacking in many of the alcohol dependent persons especially in the community based group. It implies therefore that treatment of alcohol dependence must

be accompanied by provision of both social and economic resources to enable the person to remain abstinent.

There were no serious adverse effects in the community based group during the intervention. Only one participant developed mild delirium tremens required admission to hospital for 3 days. The symptoms in the rest of the participants remitted on use of diazepam 5mg and carbamezepine 200mg at night confirming once again the feasibility of community based detoxification.

That, individuals who had began drinking at or before the age of 18 years were more likely to stop drinking alcohol after six months of treatment, is probably because most of these individuals had wasted the important years of schooling that would have enabled them to better their lives. They were likely to have longer experience with alcohol related problems including; broken relationships with family and friends, unemployment, lack of income, poverty and general hopelessness. Such experiences were likely to have made them more desperate for help and increased their motivation and determination to stop drinking than their counterparts who began drinking at a later age and had shorter experiences with similar problems. This finding is consistent with report by (Moos, et al., 2006), who reported that individuals who have experienced more drinking problems and tried previously to reduce their drinking without success may be more motivated and ready to learn coping skills imparted in treatment. Many of the community based group had tried to stop drinking alcohol on their own, but the withdrawal symptoms were a hindrance and the provision of free treatment for the alcohol dependence provided a solution to the problem.

Individuals who were drinking daily at intake were more unlikely to stop drinking. Such individuals are likely to be more dependent on alcohol and require more determination to stop drinking. This finding is consistent with those by other studies that report a lower likelihood of remission in individuals with frequent and heavy alcohol consumption (Armor, et al., 1983; Mclellan, et al., 1994; Both, et al., 2004).

The current study did not however find any statistically significant association between the sex, age, marital status or education of the participant and the treatment outcome. This is inconsistent with other studies that show an association between short term remission and female gender, older age, married status and good education (Armor, et al., 1983; Mcclellan, et

al., 1994; Both, et al., 2004; Granfield, et al., 2001), possibly because most of the participants had minimal differences in education status and age.

Other studies have shown a less favourable outcome of women after treatment (Bottlender and Soyka, 2005), and Anton, et al., (2006). Grella, et al., (1999) reported that women have other treatment needs than men and found differences in the treatment needs of women and men. According to Sigmon, et al., (1995) it is possible that different coping strategies are a reason for different demands in alcohol treatment. Additionally, women were found to show different patterns of alcohol exposure and a different course of the disease (Mckay, 2003; Foster, 2000; Chou, 1994).

Individuals who had a daily desire for alcohol at intake were found to be unlikely to stop drinking alcohol at six months. The finding is consistent with several relapse theories that utilize the concept of craving as a major aetiology in relapse of alcohol dependence (Ludwig, et al., 1974). Craving for alcohol is associated with a desire to use the alcohol and those with severe craving are more unlikely to stop drinking alcohol as compared to those with mild craving. This is probably because craving is more of a sign of biological addiction.

Those that were in remission for the 6-month treatment and those that relapsed had no differences in their various characteristics that could account for the outcome. The relapse to alcohol was random and unsystematic with those who relapsed having similar characteristics to those who were in remission 6 months after onset of the study.

**Conclusion**

From the foregoing discussion, it can be concluded that community based treatment is feasible and ethically suitable. This supports conclusion by Collins, et al., 1990 that a structured outpatient detoxification programme is safe and effective and may obviate the need for many patients being admitted, freeing psychiatric beds for other users.

## 5.13.0 Objective 3 and 4: To Determine the Financial Cost of Community Based and Institution Based Detoxification and Rehabilitation of alcohol dependent persons

### 5.13.1 Cost of Detoxification

The cost of detoxification was obtained from the expenditure record of each patient. Table 15 shows the cost for detoxification for individuals that completed the 3-pabrinex injections. The cost of community based rehabilitation is shown in tables 16- 17 while that of institution based detoxification and rehabilitation is shown in tables 18 and 19.

**Table 15: Cost of Materials and consumables for Community Based Detoxification per Patient**

| | | Cost per unit | | Total cost per person | |
|---|---|---|---|---|---|
| Name of item | Quantity per person | KSH | USD | KSH | USD |
| Pabrinex injection | 3pairs of vials | 460 | 6.57 | 1380 | 19.71 |
| Carbamazepine 200mg | 10 tablets | 10 | 0.14 | 100 | 1.43 |
| Diazepam 5mg | 5 tablets | 5 | 0.07 | 25 | 0.36 |
| Needles | 3 | 5 | 0.07 | 15 | 0.21 |
| 10 ml syringes | 10 | 10 | 0.14 | 100 | 1.43 |
| Surgical spirit | 10ml | 1 | 0.01 | 10 | 0.14 |
| Cotton swabs | | 1.5 | 0.02 | 282 | 4.03 |
| Total cost | | 492.5 | 7.04 | 1630 | 23.3 |

The calculations for the costs were discussed under methods.

**Table 16: Other costs for community based detoxification**

| Item | Quantity or frequency | Cost per person per unit | | Total cost | |
|---|---|---|---|---|---|
| | | KSH | USD | KSH | USD |
| Doctors Cost for detoxification | 3 visits | 2000 | 28.6 | 6000 | 85.7 |
| Nurse cost for detoxification | 3 visits | 1000 | 14.3 | 3000 | 42.9 |
| Cost of room | 39 visits | 1000 | 14.3 | 39000 | 557.1 |
| Administrative costs | 24 weeks | 700 | 10 | 16800 | 240 |
| | | 4700 | 67.2 | 64800 | 925.7 |

The calculations for the costs were discussed under methods.

## Table 17: Cost of Human Resource for Community based rehabilitation

| Name of item | Number of visits | Cost per unit | | Total cost | |
|---|---|---|---|---|---|
| | | KSH | USD | KSH | USD |
| CBHW (Payments) | 48 visits | 200 | 2.9 | 9600 | 137.3 |
| Group therapy | 12 sessions | 2000 | 28.6 | 24000 | 342.9 |
| Doctors follow up | 24 visits | 2000 | 28.6 | 48000 | 685.7 |
| Total | | 4,691 | 67.01 | 81,600 | 1,165.9 |

The calculations for the costs were discussed under methods.

## Table 18: Cost of institution based alcohol detoxification per person

| | | Average Cost per unit | | Total cost per person | |
|---|---|---|---|---|---|
| Name of item | Quantity | KSH | USD | KSH | USD |
| Pabrinex injection | 5 pairs of vials | 561.20 | 8.02 | 1,380.00 | 19.71 |
| Carbamazepine 200mg | tablets | 35.60 | 0.51 | 100.00 | 1.43 |
| Diazepam | 20 tablets | 3.00 | 0.04 | 25.00 | 0.36 |
| Giving set | 5 sets | 38.20 | 0.55 | 15.00 | 0.21 |
| 10 ml syringes | 5pieces | 9.36 | 0.13 | 100.00 | 1.43 |
| Total | | 647.36 | 9.25 | 1,620.00 | 23.1 |

The calculations for the costs were discussed under methods.

## Table 19: Cost of institution based detoxification and rehabilitation per person

| | Rehabilitation cost (KSH) | | | Average cost for Detoxification | | Total cost | |
|---|---|---|---|---|---|---|---|
| stitution | Period of stay | KSH | USD | KSH | USD | KSH | USD |
| A1 | 3months | 63000 | 900.00 | 77329.5 | 1104.7 | 140,329.5 | 2004.7 |
| A2 | 3 months | 63000 | 900.00 | 77329.5 | 1104.7 | 140,329.5 | 2004.7 |
| R | 3months | 180000 | 2,571.43 | 77329.5 | 1104.7 | 257,329 | 3676.1 |

The calculations for the costs were discussed under methods.

### 5.13.2 Discussion of objectives 3 and 4

The cost of community based intervention was 1.7 times cheaper than the unsubsidized institution based intervention. Both treatments however did not account for the time spent by patients in seeking treatment and the cost of transport to and from the place of treatment. This is in keeping with disease control priorities (Jamison, et al., 2006) recommendation that the cost of producing an intervention but not the costs of consuming it be counted.

The findings of the current study are consistent with findings of other studies, which report that inpatient, and outpatient modalities have comparable effectiveness despite the differences in the cost (Finney and Monahan, 1996, Mclellan, et al., 1997), the cost of the latter being lower. Kujimana, et al., (1995) reported calculated inpatient detoxification to be six times more expensive than outpatient detoxification. This ratio is higher than that of the current study possibly due to regional variable that affect direct costs to treatment.

**Conclusion**

Community based detoxification and rehabilitation of alcohol dependent persons is 1.7 times cheaper than institution based detoxification and rehabilitation of alcohol dependent persons.

## 5.14.0 Objective 5: To compare the cost effectiveness of CBDR and IBDR of alcohol dependent persons

Using the CBDR approach, of the 188 drinkers who began therapy, 74 of 130 who were able to be traced after six months (56.9%) had stopped drinking in the 6 months period of follow up. With the IBDR approach, 35 (44.3%) of 79 reached after six months had stopped drinking With the CBDR approach, about 23 additional patients will stop drinking as compared with the IBDR approach considering intervention is applied to 188 drinkers assuming the same rate of drinking cessation.

**Table 20: The Cost effectiveness for CBDR and IBDR**

| Programme | Cost ($) | % of Quitters | CEA($/life time quitter) |
|---|---|---|---|
| CBDR | 2114.9 | 56.9 | 1203.38 |
| IBDR (A) | 2004.7 | 44.3 | 888.08 |
| IBDR (B) | 3676.1 | 44.3 | 1628.51 |

For the 188 patients treated, the IBDR (A) approach would initially cost $ 20717.6 less than the CBDR approach or on average $ 110.2 less per person and IBDR (B) will cost $ 293505.6 more than the CBDR approach, or an average of $ 1561.2 per person. However, CBDR would save a per drinker average of $ 789.8 to $ 3785.8 as compared to IBDR (A) and IBDR (B) respectively in stop drinking cases. Comparing IBDR (A) and IBDR (B), the IBDR (B) would initially cost a total of $ 314223.2 more than the IBDR (A) which is on average $ 1671.4 per person. At institution IBDR (A), an average save per drinker is $ 2962.03 for the stop drinking. This implies that community based detoxification and rehabilitation of alcohol dependent persons was more cost effective than the institution based detoxification and rehabilitation but less cost effective than the subsidized institution based treatment.

## 5.15. Discussion of Objective 5

Cost effective analysis is a method for assessing the gains in the health relative to the cost of different intervention. In the current study the gains achieved in community based and institution based intervention for alcohol dependent persons were assessed and the financial and scientific implications of the community and institution based interventions were directly related. The remission rates for the community based intervention were 56.9% while that of the institution based intervention was 44.3%. The cost of institution based treatment at the private rehabilitation centre was 1.7 times more expensive than the community based intervention. The community based intervention had a save a per drinker average of $ 789.8 to $ 3785.8 as compared to IBDR (A) and IBDR (B) respectively in stop drinking cases. Institution IBDR (A) was a mission based rehabilitation centre with a subsidized cost while IBDR (B) was a private rehabilitation with the actual expected cost of rehabilitation in Kenya.

The cost effective analysis shows that community based intervention is cheaper than institution based intervention for alcohol dependent persons. A clinically controlled randomized study would have been ideal in firmly confirming the cost effectiveness of the two interventions but this was not within the financial scope of the current study. In spite of this limitation it is however possible to conclude that community based intervention of alcohol dependent persons is cheaper, than IBDR, feasible, ethically acceptable and effective.

Further, the current study has shown that besides the cost advantage, it is possible to implement community based detoxification and rehabilitation of alcohol dependent persons. Advantages that would arise from such an implementation would include, availing the limited bed space in the rehabilitation centres to persons suffering from other substance dependencies and secondly, relocation and effective deployment of national funds to an intervention that is cheap and effective. This would help meet the challenges associated with alcohol dependence and redress inequities and proper use of scarce resources.

Thirdly, the many alcohol dependent persons in the informal settlements who cannot afford institution based treatment would receive cheaper treatment at community level. This would also enable the health workers to incorporate health education and the government or NGO'S institute self help groups in order to improve their socio economic status.

In addition to its cost and effectiveness, community based intervention in alcohol treatment has a number of advantages. Firstly the treatment can be done at the lower level of a country's health facility system (dispensary) enabling the person to receive the treatment at primary health care level so long as relevant health professionals are deployed to the centres. Secondly the person recovers while within the community without interrupting their jobs or their daily income producing activities. In addition recovery within the community may reduce the stigma associated with alcohol dependence treatment. Thirdly the community-based treatment for alcohol dependent persons is not linked to bed capacity unlike the institution based intervention and many individuals can be treated at a cheaper cost. This implies that a large population of alcohol dependent persons can receive treatment. This would provide treatment services for the many alcohol dependent persons in the poor communities where alcohol problems are common.

On the other hand institution based intervention for alcohol dependent persons offers the individual a 3 months protected period from friends, peer and alcohol. It is however more expensive, capacity of people treated depends on bed capacity and is associated with stigma and relapses after return into the community. The lack of a structured and regular aftercare programme for persons treated at the institution (rehabilitation) centre is worrying and may have contributed to the lower remission rate in the IBDR group. There is therefore need for after care programmes for patient's discharge from rehabilitation center in order to reduce the remission rate of treated persons.

Community based detoxification and rehabilitation of alcohol dependent persons is relatively cheaper yet has the potential to reduce the disease burden substantially. Similarly, Kujimana, et al., (1995,) reports that community outpatient detoxification is a cost effective step in the treatment of alcohol dependent patients (Kujimana, et al., 1995).

Studies report that population based interventions are cost effective when effectively targeted to populations in which disease is prevalent (Laximinarayan, et al., 2006). In the current study targeting the alcohol dependent populations in the slums and often poor communities at the health centre or dispensary levels would reduce the cost of treatment since the infrastructure is already in place. This would be consistent with WHO (2008) recommendations of reaching out large populations. The findings of this add support to the WHO concepts.

Community based interventions have been reported to promote supportive public opinions and health policy mainstreaming in order to reach a large number of patients. It also involves and supports the families of the patients in the therapeutic process.

**Conclusion**

Community based detoxification and rehabilitation of alcohol dependent persons is feasible, ethically implementable and more effective. It is more cost effective cheaper than institution based detoxification and rehabilitation of alcohol dependent persons.

## 5.16.0 Objective 6: To determine the co-morbid disorders in alcohol dependence

### 5.16.1 Co Morbidity

The psychiatric co morbidity was present in both the institution based and community based group. There was a statistically significant higher level of generalized anxiety disorder, specific phobia in the community based group as compared to the institution based group. However the level of social phobia was significantly higher among the institution based group than the community based group. The results are shown in table 21.

There was a highly significant reduction of the levels of all co morbid in the community based group after six months of treatment as indicated by the P values. The results are shown in table 22.

**Table 21: Psychiatric co morbidity in institution and community based group (both at intake)**

| | | Institution (n88) | Community (188) | |
|---|---|---|---|---|
| Depression | | | | |
| | Yes | 52.3% (n46) | 63.8% (n120) | p value =0.45** |
| | No | 47.7% (n42) | 36.2% (n68) | |
| Bipolar mood disorder | | | | |
| | Yes | 35.2% (n 31) | 34 % (n64) | p value =0.892* |
| | No | 64.8% (n 57) | 66 % (124) | |
| ADHD | | | | |
| | Yes | 1.1 % n 1) | 28.7 %( n 54) | p value =0.46** |
| | No | 60.2% (n 87) | 71.3% (n134) | |
| GAD | | | | |
| | Yes | 19.3 % (n 17) | 42.6% (n 80) | p value = 0.000*** |
| | No | 99.9 % (n 71) | 57.4 % (n 108) | |
| Specific phobia | | | | |
| | Yes | 3.4 % (n 3) | 45.7 %( n 86) | p value = 0.000*** |
| | No | 96.6 % (n 85) | 54.3% (n 102) | |
| Social phobia | | | | |
| | Yes | 67 % (n 59) | 23.9 % (n 45) | p value = 0.01** |
| | No | 33 % (n 29) | 76.1 % (n 143) | |

## Table 22: Psychiatric co morbidity (community group)

| | Community based group | | |
|---|---|---|---|
| Co-morbid disorder | % at intake (188) | % at 6mths (130) | p value |
| Depression | 63.8% (n120) | 10.7% (n 14) | 0.000*** |
| Bipolar | 34.0% (n64) | 7.7 % (n 10) | 0.000*** |
| ADHD | 28.7% (n 54) | 2.3 % (n 30) | 0.000*** |
| GAD | 42.6% (n 80) | 6.1 % (n 8) | 0.000*** |
| Social | 23.9% (n45) | 4.6 % (6) | 0.001*** |
| Specific phobia | 45.7% (n 86) | 6.1 % (8) | 0.000*** |

Psychiatric co morbidity for institution based group was not determined at 6mths. $X^2$ calculation for this group was therefore not done.

### 5.16.2 Poly substance use

Poly substance use was noted in both the community and institution based participants. There was a statistically significant higher prevalence rates in use of tobacco, cannabis and caffeine among the community based group as compared to the institution based group.

There was no statistically significant difference in use of all the substances among the community based participants at the beginning of the study and at six months (Tobacco, P value = 0.881; Caffeine, P value = 0.629; cannabis, P value = 0.45; amphetamines = P value = 0524). Use of cocaine, opiods, hallucinogens and inhalants remained constant. The results are shown in table 23.

## Table 23: Use of other substances of abuse at intake

| | Institution | Community | $X^2$ | P value |
|---|---|---|---|---|
| Caffeine | | | | |
| Never | 6.2% (n7) | 39.8% (n45) | 19.608 | 0.01** |
| Once or twice | 5.3% (n6) | 7.1% (n8) | | |
| Monthly | 5.3% (n6) | 0.9% (n1) | | |
| Weekly | 0.9% (1) | 0.9 % ( n1) | | |
| Daily | 8.8 % (n10) | 24.8% (n28) | | |
| | 26.5% (n30) | 73.5% (n83) | | |
| Tobacco | | | | |
| Never | 2.3% (n5) | 7.9% (n17) | 4.560 | 0.335* |
| Once or twice | 1.9% (4) | 3.7% (n8) | | |
| Monthly | 1.43% (n3) | 4.2% (n3) | | |
| Weekly | 2.3% (n5) | 1.4% (n3) | | |
| Daily | 24.4% (n53) | 50% (n107) | | |
| Total | 37.7% (n70) | 67.3% (n144) | | |
| Cannabis | | | | |
| Never | 10.2% (n13) | 37% (n47) | 18.223 | 0.001*** |
| Once or twice | 4.7% (6) | 2.4% (3) | | |
| Monthly | 0.9% (n1) | 3.1% (n4) | | |
| Weekly | 0.8% (n1) | 1.6% (2) | | |
| Daily | 6.3% (n8) | 21.3% (n27) | | |
| Total | 34.6 % (n44) | 65.4% (n83) | | |
| Cocaine | | | | |
| Never | 22.8% (n21) | 63% (n58) | 14.040 | 0.007* |
| Once or twice | 4.3% (n4) | 3.3% (n3) | | |
| Monthly | 0% (n0) | 1.1% (n1) | | |
| Weekly | 2.2% (n2) | 0% (n0) | | |
| Daily | 3.3% (n3) | 0% (n0) | | |
| Total | 32.6 % (n30) | 67.4 % (n62) | | |

| | Institution | Community | $X^2$ | P value |
|---|---|---|---|---|
| Amphetamines | | | | |
| Never | 16.7% (n17) | 46.1% (n47) | 5.200 | 0.267* |
| Once or twice | 3.9% (n4) | 10.8% (n11) | | |
| Monthly | 5.9% (n6) | 4.9% (n5) | | |
| Weekly | 1.0% (n1) | 4.9% (n5) | | |
| Daily | 2.9% (n3) | 2.9% (n3) | | |
| Total | 30.4 % (n31) | 69.6% (n71) | | |
| Inhalants | | | | |
| Never | 22.5% (n20) | 65.2% (n58) | 7.009 | 0.135* |
| Once or twice | 1.1% (n1) | 2.2% (n2) | | |
| Monthly | 2.2% (n2) | 1.1% (n1) | | |
| Weekly | 0% (n0) | 1.1% (n1) | | |
| Daily | 3.4% (n3) | 1.1% (n1) | | |
| Total | 29.2 % (n26) | 70.8 % (n63) | | |
| Sedatives | | | | |
| Never | 23.4% (n22) | 61.7% (n58) | 4.976 | 0.290 |
| Once or twice | 3.2% (n3) | 5.3% (n5) | | |
| Monthly | 2.1% (n2) | 1.1% (n1) | | |
| Weekly | 1.1% (n1) | 0% (n0) | | |
| Daily | 1.1% (n1) | 1.1% (n1) | | |
| Total | 30.9 % (n29) | 69.1% (n65) | | |
| Hallucinogens | | | | |
| Never | 24.7% (n22) | 68.5% (n61) | 7.588 | 0.055* |
| Once or twice | 1.1% (n1) | 2.2% (n2) | | |
| Monthly | 1.1% (n1) | 1.1% (n1) | | |
| Weekly | 2.2% (n2) | 0% (n0) | | |
| Daily | 0% (n0) | 0% (n0) | | |
| Total | 29.2 % (n26) | 70.8 % (n63) | | |

| | Institution | Community | $X^2$ | P value |
|---|---|---|---|---|
| Opiods | | | | |
| Never | 23.7% (n22) | 66.7% (n62) | 11.081 | 0.26 |
| Once or twice | 0% (n0) | 1.1% (n1) | | |
| Monthly | 1.1% (n1) | 1.1% (n1) | | |
| Weekly | 4.3% (n4) | 0% (n0) | | |
| Daily | 1.1% (n1) | 1.1% (n1) | | |
| Total | 30.1 % (n28) | 69.9 % (n65) | | |

### 5.16.3 Discussion of objective 6

Emerging global trends shows that drug abuse is co morbid with certain psychological and social pathologies (Boys et al 2003) with a well recognized relationship between substance use disorder and other psychiatric morbidity. The findings of the current study were consistent with this global trend. Alcohol dependence was found to be co morbid with depression, GAD, specific phobia Bipolar mood disorder, ADHD and social phobia (in that order of prevalence).

The presence of high co morbidity in the current study is consistent with findings by Ndetei, et al., (2008) and Schneider, et al., (2001).

Severe studies have demonstrated the extent of co-morbidity between depression and alcoholism (Spanner, et al., 1994, Grant, et al., 1995, Ross, et al., 1995., Kessler, et al., 1997). Depression may reduce the resolve to refrain from alcohol, or alternatively depression may lead to self medication with alcohol (Khantizian, et al., 1990).This may explain why relapse rates are high after treatment for alcohol dependence. A better understanding of the nature of depression has important public health significance (Hasin, et al., 2002; Khantizian, et al., 1990) and antidepressants have been shown to exert a modest beneficial effect for patients with combined depressive disorder and alcohol dependence (Nunes, et al., 2004).

Untreated mood disorder and anxiety disorders are likely to be associated with poor outcomes (Nurbnberger, et al., 2004).

The current study showed 28.7% prevalence of morbidity of ADHD with alcohol dependence for the community based group. Although other studies (Marshal, et al., 2007; Molina, et al., 2007), report that children with ADHD are at higher risk of problem drinking during adolescent and latter life, the prevalence of ADHD co morbidity in the current study is quite high. The prevalence of adult ADHD in the general population is 2% to 5% and the unusually high prevalence rate in this community based group was unexpected. The prevalence rate of ADHD in the institution based was 1.1% and within expected rates. The differences are difficult to explain and it is important to explore whether this is a true reflection of rates of ADHD or an artefact finding. The other possibility is that symptoms of ADHD which cleared after treatment were picked by the instrument.

The other possible reason may be that the impulsively and distractibility in persons suffering from ADHD is likely to lead them into alcohol abuse and other related problems. The study also showed high co morbid rates of social phobia and specific phobia. Persons with social or specific phobia may use alcohol in attempt to treat the associated anxiety.

In the current study persons in the community based group who were found to have co morbid disorders were referred for treatment at the mental health clinic at the Kangemi Health centre although the outcome of the referrals were not within the scope of the current study, this is likely to explain the better remission rate (at six months) in the community based group compared to institution based group. This has important implications of the treatment of alcohol dependence persons. It is not adequate to just treat the alcohol dependence but the co morbid disorders should be treated in order to obtain sustainable remission after treatment.

### 5.16.4 Poly substance use

There was poly substance use in the current study, a finding which is consistent with global trends. There was a statistically significant higher prevalence rates in use of tobacco, cannabis and caffeine among the community based group as compared to the institution based group. The use of cannabis is likely to further complicate the treatment of alcohol dependence due to a motivation syndrome. The significant use of caffeine is difficult to explain since coffee is not a popular drink in Kenya: most people prefer tea. There was no statistically significant reduction in the use of all the substances after six months of treatment for the community based participant (the use of these substances was not determined for the institution based group- see caveats). Poly substance abuse may explain the not so good remission rates for both community and institution based groups.

To prevent relapse after alcohol dependence treatment, it is therefore necessary to treat the co morbid disorders as well as other substance use disorder.

**Conclusion**

Co morbidity being prevalent in alcohol dependence requires that the various co occurring disorders and substance use be treated to increase the remission rates and period after alcohol treatment.

## 5.17.0 Objective 7: To determine the chemical analysis of alcohol samples

## 5.17.1 Alcohol Analysis

Table 24 shows the chemical analysis report of the licit alcohol brews while table 25 shows that of the three illicit brews, four out of the eleven licit brews had not complied with the recommended Kenya Bureau of Standards levels of ethanol. Samples in report F523 and F525 had lower than recommended ethanol levels. Sample F518 was labeled as an herbal brew but was found to have a high content of ethanol (8.9%v/v), qualifying it to be a stronger than beer and in the range of fruit wines (8- 14%v/v ethanol content). The manufacturer labeled sample F 519 as a traditional brew but the ethanol content (31.5%v/v) qualified it to be a spirit.

Two of the illicit brews were within the beer range of alcoholic brews while the third one was within the spirit range as shown in table 25.

## Table 24: Analytic report of Illicit Alcohol Beverages

| Sample identity No. | Sample description | Ethyl alcohol content% V/V | KEBS recommended levels of ethanol | Methanol levels (PPM) | Total dissolved solids (m/v)% | Max. recommended dissolve d solids | KEBS Compliant/ Non-compliant | Comment |
|---|---|---|---|---|---|---|---|---|
| F 517 | Tiger Brandy | 39.16 | 37.5(min) | Nil | 0.045 | 2.0 | Compliant | |
| F 518 | 'Miti ni dawa' | 8.90 | | Nil | Nil | | Non compliant | t |
| F 519 | 'Kienyenji' African brew | 32.21 | Nil | Nil | 0.0029 | 0.0284 | Non compliant | |
| F 520 | 'Stega traditional brew" | 3.97 | | Nil | Nil | | compliant | complies with KEBS Requirements |
| F521 | Kenya King Gin | 41.92 | 37.5 (min) | Nil | 0.0047 | 1.5 (max) | compliant | |
| F 522 | Hardyman gin extra | 38.84 | 37.5 (min) | Nil | 0.0168 | 0.5 (max) | Compliant | |
| F 523 | Free Gin | 32.21 | 37.5 (min) | Nil | 0.0029 | | Non-compliant | lower than recommended Ethyl alcohol content |
| F 524 | Raaz brandy | 38.07 | 37.5 (min) | Nil | 0.0352 | 2.0 (max) | compliant | |
| F 525 | Lakers extra golden spirits | 33.58 | 37.5 (min) | Nil | 0.0029 | 1.5 (max) | Non-compliant | |
| F 526 | Kana extra golden label | 39.29 | | Nil | 0.0252 | | Compliant | complies with KEBS Requirements |
| F 527 | Safari Ice berg Liquor | 11.45 | | Nil | Nil | | Compliant | |

## Table 25: Analytic report of Illicit Alcohol Beverages

| Sample No. | Sample Description | Ethanol content % (v/v) |
|---|---|---|
| F480/07-08 | 'Chang'aa' | 33.54 |
| F481/07-08 | 'Muratina' | 4.84 |
| F482/07-08 | 'Busaa' | 6.03 |

### 5.17.2 Discussion of objective 7

Discrepancies between the actual and the permitted content of ethanol in alcoholic brew may benefit the manufacturer but be dangerous to the alcohol user. Alcoholic brews with high ethanol content are more damaging to health of a person as compared to those with low ethanol content. The manufacturers who had brews with higher than recommended ethanol in their alcohol brews may have deliberately done so in attempt to evade taxation. Taxation of alcoholic brews is done according to the ethanol content of the brew.

Herbal medicines are used by many in Kenya, and are widely believed to be beneficial to a person's health. For this reasons brews labeled as herbal are likely to be used excessively. Such users may eventually become alcohol dependent. Others may increase the ethanol content in attempt to attract customers especially those that take alcohol for the purpose of getting drank. Although no methanol was found in any of the 14 samples there have been media reports in the past of people drinking methanol contaminated alcohol with devastating results (Wanjiku, 1999).

Maintaining the recommended alcohol standards is difficult in informal settlements where law and order is mostly not observed and law enforcers may not be able to penetrate the area due to unplanned and congested residential and business premises. Furthermore, adequate social or health facilities are unavailable to assist the dependent persons. As a result the majority of them remain trapped in alcohol dependence and poverty. This is further complicated by the fact that the government lacks a clear alcohol policy to deal with alcohol related issues. Even where certain legislation exists there is laxity by policy makers in Kenya and the larger East African region to implement them.

# Chapter Six

## 6.0 Discussion of Major Findings

Cost effectiveness of alcohol dependence treatments in Kenya has not been studied before, the current study is a pioneer study whose results compare and contrast with those of similar studies the world over.

All the objectives of the study were fulfilled: though the community based and institution based groups but differed in a number of ways as discussed earlier under objective discussion. The purpose of the study was to determine the cost effectiveness of community based group. Since institution based intervention was already in place, as a form of intervention for persons with alcohol dependence, the individuals in the institution based group were studied in their 'normal'" environment of treatment. This means that no attempt was made to alter the usual way of treating alcohol dependent persons in the various institutions. The advantage is that the study was able to determine the co morbidity, cost and effectiveness of institution based intervention of alcohol dependent persons as it is in Kenya today.

Furthermore the results of the current study showed that establishment of community based treatment of alcohol dependence can be implemented in Kenya. This would be in line with the WHO recommendation for development of services that can reach the maximum number of individuals and have the greatest impact at lowest cost. This is likely to be achieved with broad community based health care services; such services should involve working with individuals in their own communities over longer periods of time (WHO, 2008).

In developing community based health interventions for alcohol dependent persons, the role of the primary health care workers cannot be underestimated; these are the personnel at community level who have the unique opportunity to screen a broad range of people for general lifestyle issues as a routine part of their health care service. Primary health care workers can be trained to offer brief intervention (that has been found to be useful) and refer those that need further management to the next level of intervention.

The study confirmed findings by a number of studies that have shown that outpatient detoxification is more cost effective than in patient detoxification (Hayashida, et al., 1989; Berg and Dubin, 1990, Soyka, 2004). That community based detoxification and rehabilitation was cheaper than the institution based detoxification and rehabilitation in the current study (1.7 cheaper) is encouraging. Further to this, the outcome after six months shows that 56.9 % of the community based participants were abstinent for the period. This indicates the effectiveness of community based detoxification and rehabilitation of alcohol dependent persons. Saving a dollar and at the same time delivering proper intervention for alcohol dependent persons in Kenya and in Africa in general is good news. This is mainly because most African nations belong to the low income cadre with an added burden of communicable diseases.

High rates of co morbidity among the alcohol dependent persons raise the need to treat co morbid disorders during management of alcohol dependence. The National Institute on Drug Abuse (NIDA 1999) has concurrent treatment for co morbid disorders as one of its fundamental principles of substance induced disorders treatment (NIDA, 1999). Less than half (47%) of the rehabilitation centres in Kenya treat dual diagnosis (NACADA, 2007). These may explain the fact that in the current study only 44.3% of those treated at the institutions were abstinent after six months. Co morbid disorders are likely to cause a relapse to alcohol drinking. Consequently, it is important that co morbid disorders be screened for and treated if present to prevent relapse.

The analysis of the alcohol samples showed that the alcohol content was sometimes higher than what was recommended by the Kenya Bureau of Standards and this is a public health problem that needs to be addressed. In addition the connotation in labeling of alcoholic beverages to suggest that they have herbal contents is misleading to the customer. This is because herbal medicine is fairly accepted in the Kenya society and people use it without quantity control. Such uncontrolled drinking of alcoholic beverages which are mislabeled as herbal medicine is likely to lead to alcohol dependence in unsuspecting users. It is therefore important that quality control of alcoholic beverages be maintained. This would require an alcohol policy that is enforced.

Community based and institution based groups in the current study varied in a number of aspects as expected from the beginning of the study. The two samples were from different social economic background and no attempt was done to randomize the samples because this

was not the aim of the current study. While the institution based group was composed of persons from economically well families, the community based group participants were people from low socio economic background. The institution based intervention was studied as it was at the time of the study, with persons being recruited at admission to the rehabilitation centres, this enabled the researcher to study the institution based persons in their real management situation without interference.

The community based intervention on the other hand has not been tried in Kenya and treatment trial was experimental. Such a setting was ideal for cost effective analysis which basically involved comparison of an intervention already in place with a new intervention about to be implemented.

From the foregoing, and with the caveats mentioned earlier in mind it can be affirmed that community based detoxification and rehabilitation of alcohol dependent persons is a safe cost effective method of treatment that should be implemented to deal with the increasing prevalence of alcohol dependence in Kenya.

## Chapter Seven

# 7. 0 Conclusion and recommendations

## 7. 1 Limitations

One limitation of this study is that the sample is not a random selection but a targeted purposive sample of the community based group and institution based group.

During the 9th to the 11th month of study, (Dec 2007 to Feb 2008) there was political instability and insecurity in the country. This adversely affected the follow up of the study group both by the CBHWs and by the PI. In addition a number of the participants were displaced due to the tribal clashes and they could not be traced thereafter.

The use of intravenous Pabrinex injection deterred some alcohol dependent persons in the community based intervention who would have preferred an intramuscular injection, which is unavailable in the Kenyan market.

Another limitation was on the collection of institution based group follow up data. The follow up of participants in the control group was not physically possible because the rehabilitation centres do not have aftercare programme after discharge. Relapse and remission rates could not be collected in a face to face interview for the IBDR group because the participants had been discharged from the rehabilitation centres and had returned to their homes in the various parts of the country. However post test data for this group was obtained successively through a telephone interview.

## 7. 2 Conclusion

Community Based Detoxification and Rehabilitation is a safe and cost effective treatment for alcohol dependence and should be considered as a treatment of choice especially for the socio economically deprived. Implementation of community based treatment of alcohol dependent persons would enable the majority of people to receive treatment at a fair cost while at the same time continuing with their daily routines. The reduction of the cost goes beyond the

figures calculated if the social and economic contribution to the community during recovery is measured.

## 7.3 Recommendations

### 7.3.1 Community based versus institution based detoxification and rehabilitation of alcohol dependent persons.

Since the current study, the first of its kind in Kenya has shown that community based detoxification and rehabilitation of alcohol dependence is safe, effective implementable and more cost effective than institution based treatment there is need to change approach to alcohol dependence management.

Implementation of community based detoxification should largely replace institution based treatment. The Ministry of Health should implement community based alcohol treatment programmes at primary health care levels. Such decentralization and integration of alcohol treatment services should be done using the existing health personnel and health facilities right from the health centres, districts hospitals and provincial hospitals.

Community based detoxification and rehabilitation would be ideal especially for populations living in the informal settlement scheme. This has been proved to be effective while at the same time being capable of reaching a large number of alcohol dependent persons especially those who cannot afford institution based treatment.

### 7.3.2 The Role of Community Based Health Workers (CBHW)

The importance of the role played by the CBHWs in community based rehabilitation should be recognized. Using the CBHW is an important aspect of community based alcohol treatment. The Ministry of Health should also train and employ community based health workers (people who live within the communities) to assist in health education and to act as a link between the ministry and the community. This would enable the ministry to understand the extent of the

alcohol problems and implement health and social amenities to deal with the problem Training of all other personnel involved in community based treatment will be necessary.

### 7.3.3 Health Education at Community Level

The community should be educated on the fact that alcohol is a harmful drug and that prevention of alcohol dependence and related alcohol problems is the best way of dealing with the problem. Many of the community-based participants confessed that they had never considered alcohol as a harmful drug.

The education should be done during all types of meetings including public meetings, weddings, burial ceremonies, church services and any other available platform. The chief and the sub-chief, pastors, teachers and community elders are important people who should be trained on how to educate the communities. Another important mode of education is the radio stations. There is a vernacular radio station for almost every community in Kenya and education through this mode would be effective since it would be in a language that the people will understand and a radio station that they trust. All this will however depend on laid down government policies.

### 7.3.4 Quality Control of Alcohol

Inspection of the alcohol manufacturing plants, hygiene standards and ethanol contents of the alcohol sold in the market should be done regularly by the concerned institutions.

Alcohol samples should be analyzed regularly and randomly to ensure that recommended standards are maintained, manufacturers found to be selling alcohol whose ethanol contents are not within the recommended levels should be prosecuted. Health conditions should also be regularly inspected in the manufacturing plants and alcohol samples analyzed for impurities such as methanol and microbes.

### 7.3.5 Early Intervention in Alcohol Management

Early detection, treatment and brief intervention for risk drinkers at primary level are important and some of the easy to use screening instruments should be used at this level, e.g. CAGE and AUDIT screens.

There is need for screening of problem drinkers at the primary level and brief intervention programmes to help risk drinkers who come to seek help for other medical conditions in general. Health facilities and health professionals at all levels should be educated on alcohol related issues in a bid to early intervention.

Brief interventions are aimed at identifying people drinking at risk levels that indicate possible problems in the future, with the aim to change their pattern and level of drinking. For people with more severe problems, or people who are alcohol dependent, effective treatment modalities should also be made available. Such social and health amenities include strategies of treating alcohol dependence persons within the community. A comprehensive alcohol policy should include provisions for brief interventions and different types of treatment.

### 7.3.6 Role of NGOS and Other Partners

The NGOs and other development partners to the Ministry of Public Health have an important role in improving the socio economic status of the communities through initiation of self-help project as demonstrated by the current study. The Ministry of Health should reach out to such organizations and work in collaboration to help the people improve their socio economic status. This will help reduce relapse to alcohol dependence since a good number of alcohol dependent persons relapse due to the socio economic problems.

### 7.3.7 Illicit brews

The government should curb manufacture of illicit brews and should enable quality control on alcohol available in the market. Law enforcers should ensure that all alcoholic drinks in the market are licit since use of such brews has in the past resulted to health complications including death.

### 7.3.8 Age limit of onset of drinking

A culturally appropriate age limit that is effectively enforced should be instituted or non-alcoholic beverage consumption should be encouraged. This should aim at avoiding early onset of alcohol drinking as evidenced in the current study.

### 7.3.9 Community Based Programmes

The community has a wealth of resources in terms of materials, ideas and human, which should be utilized in dealing with alcohol dependence problem. Active participation of the members of community is necessary if health related alcohol problems are to be effectively addressed. Community support is also very necessary.

Community members support what they understand and appreciate and for this reason care should be taken in educating the communities. This should be done through community meetings, media, (especially vernacular radio stations) television and newspapers.

Community policing is a new concept in Kenya where members of the community report crime done within their locality. Such services may be extended to reporting of the manufactures of the illicit brews. This would reduce the availability of illicit alcohol and the problems related to its use.

### 7.3.10 Warning Messages on Alcohol Beverages

Manufactures should be compelled to put warning messages on the alcohol; the ministry of public health with understanding of the cost should design brews and such messages and implications of alcohol related problems. Any advertisement related to alcohol should be banned and those breaking the law should attract heavy penalties including banning of their brews. Alcohol should not be sold to people less than 18 years of age. Although this is a legal requirement it is not effectively enforced. This should be strictly enforced.

### 7.3.11 After care programmes

All drug rehabilitation programmes should have a follow up programme for patients after discharge from the centres in order to obtain sustained remission after treatment.

### 7.3.12 Screening and Treatment of co morbid disorders

All alcohol dependent persons should undergo screening for co morbid psychiatric disorders. Co morbid disorder should concurrently be treated to reduce relapse rates.

### 7.3.13 Further Research

A study to evaluate the cost effectiveness of community based and institution based detoxification and rehabilitation in a clinically randomized study should be done. The prevalence of ADHD among alcohol dependent persons as compared to the normal population is worth researching on.

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# Appendix A - Media Reports

A1.

# Brew leaves 5 blind in Embu

**By NATION Correspondent**

Five survivors of a lethal brew that killed 23 people in Embu last week have become permanently blind.

A doctor at the Embu Provincial General Hospital where the victims of the brew were admitted, said the blind included a primary school teacher, three *jua kali* artisans and a mother of two.

Dr Nicholas Muraguri in a report said other survivors were experiencing blurred vision.

He said among the dead is a 17-year-old student who was on his way to school before being lured to take the drink.

The report said 23 of the 43 people admitted to the hospital after consuming the brew died. Others may have died at home or in other medical institutions

The killer brew consumed at Muungano Joint Bar at Dallas estate in Embu town is believed to have been laced with methanol.

Three people suspected to have brewed the liquor have been appeared in court charged with manslaughter

Yesterday, Dr Muraguri said plans were under way to rehabilitate the survivors.

He said medical personnel needed training on how to handle the patients suffering from

A2.

# Boy, 11, dies after drinking 'chang'aa'

By ONDERI KEBATI, GEORGE MUNENE and KENNEDY LUMWAMU

An 11-year-old boy died after drinking *chang'aa* to assuage his hunger, police reported yesterday.

The report said Daniel Ongeti's brother provided the drink after the boy complained of hunger.

Mr Thomas Otipo, the Kisii police boss, said the brother had been arrested and would soon appear in court.

The incident, in Daraja Sub-location, Keumbu Division, was one of four Easter holiday deaths reported to Kisii police.

# Local brews may be licensed

## Kimunya Bill seeks to amend the liquor permit law to include them

By GAKUU MATHENGE

Traditional liquor such as *busaa*, *chang'aa*, *muratina* and *mnazi* may soon find its way to the supermarket shelves and other stores if a new Bill becomes law.

The Licensing Laws (Repeals and Amendment) Bill 2006 published on Thursday by Finance minister Amos Kimunya seeks to abolish the Traditional Liquor Act that governs local liquors and which tends to give them a lower status than the industrial ones regulated under the Liquor Licensing Act.

The Bill proposes to amend the Liquor Licensing Act to include traditional liquor and delete the words "traditional liquor" as defined in the Traditional Liquor Act.

The latter defines the brews as "any intoxicating liquor manufacurerd by traditional African methods other than distillation."

In Uganda, the traditional liquor, *waragi*, is distilled to acceptable standards by legal businesses that pay tax and are regulated by health authorities. This also applies to Tanzania's *konyagi*.

Should the Bill be passed into law, numerous licences and levies charged by both the local and central governments would also be scrapped.

The Bill also seeks to remove colonial relics in many licensing procedures relating to cash crops and other agricultural products. For instance, it seeks to amend the Pyrethrum Act by replacing the words "licensed grower" with just "grower."

Other licences set to go and which have been blamed in the past as not only cumbersome but also burdensome to businesses include:

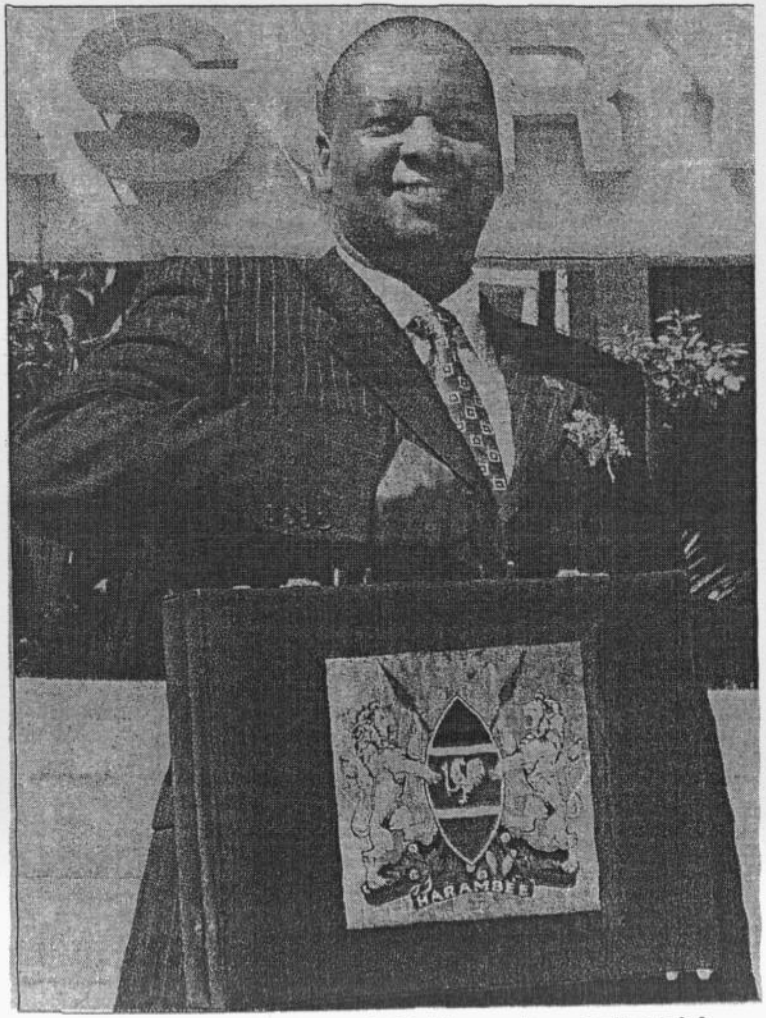
- The Hotels and Restaurants Act.
- The following items are also set to be removed from the Tourism Industry Licensing Act: souvenirs shop and stall owners, motor cycles and bicycles for hire, interpreters, and cultural centres.
- The Shop Hours Act to abolish regulation of operation of shops and employment of shop assistants and attendants;
- Use of Poisonous Substances Act so as to remove the powers of a minister to regulate storage, transport, sale and disposal of poisonous substances, which should be handled under the Pharmacy and Poisons Act.
- The Trade Licensing Act (Cap 497) will also be repealed "so as to do away with requirements for licences for businesses that have nothing to do with regulatory aspects of these businesses."

The Environmental Management and Coordination Act will also be amended "so as to abolish various licences that are either duplicated or contribute negatively to the cost of doing business in Kenya.

The overriding provisions of this Act supersede Forest, Water, Physical Planning and Local Authorities Acts, among others.

But its amendment is likely to face opposition from the environment lobby that often uses it in campaigns against powerful commercial interests.

See also *Business Sunday*.




**Finance Minister Amos Kimunya holds his remote-controlled brief case outside Treasury Building**

# Mnazi dealers make profits

## Irrigation project eased cultivation of coconut

By PASCAL MWANDAMBO

Msau Location, a little known place in the semi-arid region of Mwatate Division of Taita Taveta District has one thing that makes life tick: cultivation of coconut trees that produce *mnazi* which is popular in the province.

Anybody visiting the place which is a few kilometres from the Voi-Wundanyi road is welcomed by a cool breeze and the scenic coconut trees towering several metres high, thanks to the Msau Irrigation Project that has made the growing of the crop a reality.

The first local residents to introduce the crop in the area were Mr Sadrack Washalla, Mr Willy Kinguwo and much later Mr Derrick Mwatela who used to work with the Ministry of Agriculture in Kilifi District in the seventies.

Although the communities living in this place love *mnazi*, they have never been known to make good wine tappers *wagema* as they are popularly known in the province

Most of them cannot even tell which tree is best suited to produce coconuts or is good for tapping *mnazi*.

They even admit being scared of climbing the tall trees.

This, they say, is better done by the Mijikenda communities to whom *mnazi* is a household name and most of them deal with it from cradle to the grave.

It is for this reason that a local resident, Mr Simla Mbashu, imported wine tappers from the Giriama community to help the local people learn more about the tree

The tappers were accommodated by Mr Malalo Mwambagho.

The two tappers known only as Ali and Haji were warmly welcomed by the local community and have been been assimilated into the Taita culture.

They have married and established a home in Msau Location.

The tappers are treated with a lot of respect and are wined in the *mnazi* joints or other drinking places.

*Mnazi* is not only a popular drink at Msau, but it is being sold in other areas such as Mbale, Shigaro, Kishamba and Wundanyi.

During social functions such as weddings, Msau residents delight in drinking *mnazi*.

Those who sell it admit that they make a good living out of the trade including paying school fees for their children.

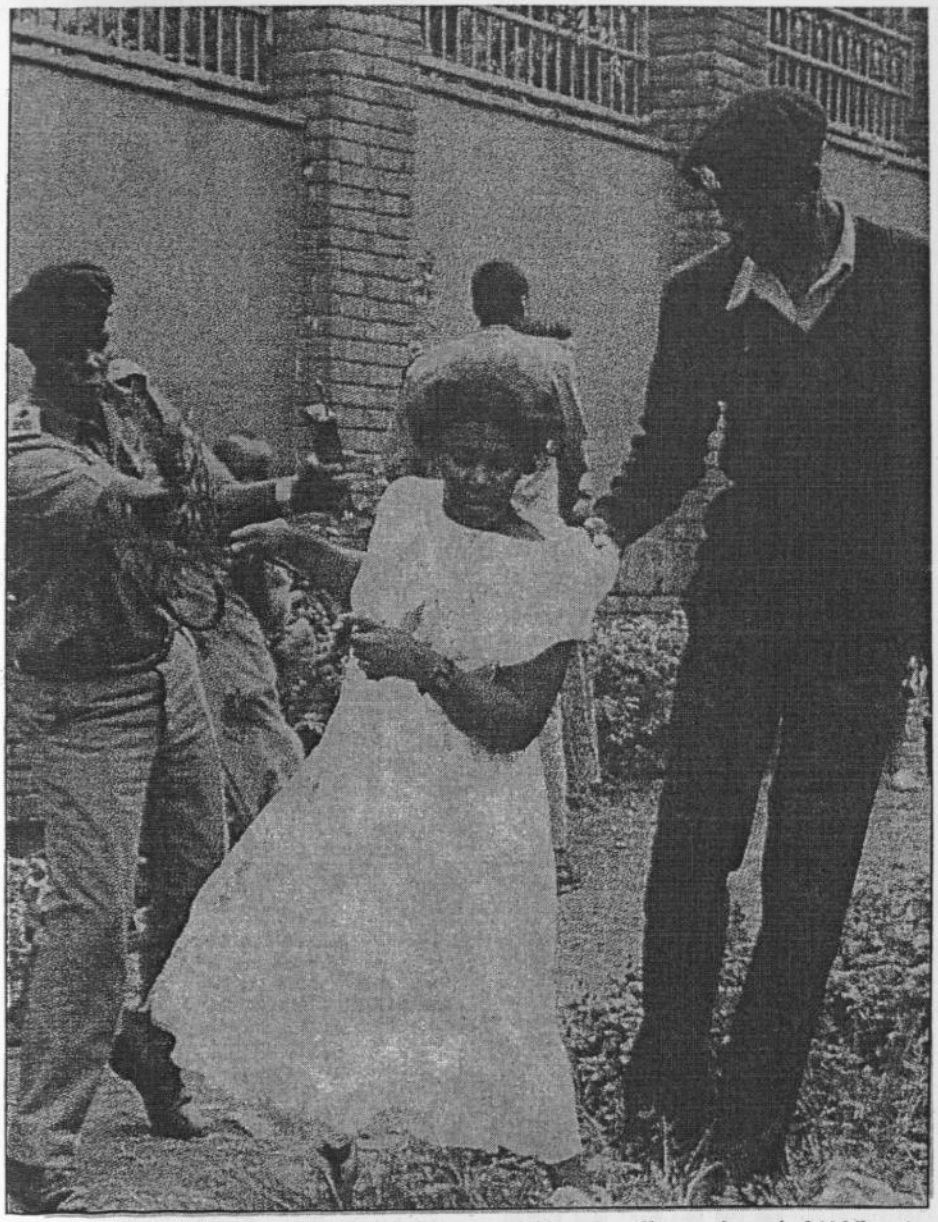
However, Christians, especially those from the Pogholonyi, have expressed outrage over the tapping of *mnazi* saying it turned residents into drunkards and loafers.

Msau residents have urged the local administration to stop harassing *mnazi* dealers since the sale of the drink had been made legal.

They accused the local chiefs of harassing the sellers in a bid to coerce them into giving them a cut of their profits.

They also charged that the chiefs demanded contributions to never-ending harambees from the *mnazi* dealers

A5.



A protestor is arrested along Chiromo Road as she and others from Kangemi marched 11 kilometres Nyayo House to present to the PC, Mr Joseph Kaguthi, grievances about chang'aa and bhang deal The woman and several others arrested were later released. (Picture by PAUL WAWERU)

# Women in demo over chang'a

**By NATION Correspondent**

More than 400 women demonstrated at Nairobi's Kangemi shopping centre before marching to the PC"s office in the city centre.

They were protesting at alleged protection of *chang'aa* brewers by local administrators.

They walked 10 kilometres to the City Centre where they met with the Nairobi deputy provincial commissioner, Mr Njoroge Ndirangu at Nyayo House.

They had earlier gathered outside the local chief's camp and complained that their efforts to have two prominent *chang'aa* and drug dealers in the area arrested and charged had been ignored.

Police from Kabete and Kilimani stations were unable to restrain the women's march. Westlands DO Joel Makori was also ignored when he pleaded with the group to turn back.

They told the *Nation* that DO and the police had failed turn up for a general swoop org ised to flush out *chang'aa*, d dealers and other criminals v were operating in the area.

"Instead, police went ro alerting the brewers of our inte ed swoop," they said.

Last Wednesday the wor launched an operation against s pected *chang'aa* and drug deal in the area.

# Why Kangemi women are angry

FROM PAGE 1

Tell them to leave our village!"

But the sellers are not about to leave, particularly because they easily shift to another base the moment they are exposed.

There are five adjoining villages in Kangemi: Kibuti, Marenga, Sodom and Gishagi, which has two ridges called Rift Valley and Gishagi. Houses are rented out at an average of Sh1,000.

"The moment one is identified to be selling *chang'aa*, he or she stops selling and rents another house in another part of Kangemi," says chief Jalendo.

"Unless the landlords report tenants found selling these liquors to us, there is no way to know.

"There will be no time that policemen will be posted outside every house suspected of selling *chang'aa* and wait to make an arrest. We can only use information and lay traps.

"These people are quick thinkers," Jalendo says of the *chang'aa* sellers. "They dispose of their stuff very fast."

There seems to be an elaborate distribution network that ensures that the main sellers (there are two women known to the villagers), supply the liquor to small-scale sellers who retail it in their houses.

But the women know who is selling and when they sell it, and they lament that they haven't been getting support from the local administration.

"Before we took to the streets, we had sought help six times from the chief's office but to no avail," says Grace. "We said enough is enough and decided to go it alone."

The women accuse policemen sent to arrest the *chang'aa* dealers of corruption, and claim they receive bribes and set the culprits free.

"We found a policeman drinking at one of the houses that we raided," said another woman.

But chief Jalendo insists that his men were doing their best, and says the answer to the problem lies with landlords.

"The problem is that most of the house owners are men who also drink the brews."

But the women think otherwise: "We should be given the power to flush out the sellers because they live within our midst and we know them," suggests Hannah.

The chief disagrees: "The mob effort won't yield much," he says, "It serves better to alert the perpetrators and they flee before you reach them."

Women in the neighbouring Muguga location have formed vigilante groups to try and stamp out drinking of illicit brews in the villages of Kamuguga, Kanjeru, Muguga and Katitu. Just as in Kangemi, they feel the arrest and release of suspected *chang'aa* dealers does not serve to reduce the number of offenders.

*Chang'aa* selling is lucrative business. A glass costs Sh20, and the bottomline is that the seller can use water to dilute the stuff and double the profit.

Time will tell whether things cool down in this place where a mother said "you can buy any drug right now as I stand here and as the police are watching."

A7.

# Killer liquor had methanol, cresols

By REBECCA WANJIKU

**THE illicit brew that killed 23 people at a bar in Dallas, Embu, contained industrial chemicals, methanol and cresols, a government chemist analysis revealed yesterday.**

**After the deaths, samples of the illicit brew were taken for analysis by Ministry of Health officials based in Embu district. The brew was consumed on September 18 this year.**

**In a press statement, Medical Services Minister Amukowa Anangwe appealed to members of public to desist from consuming illicit brews.**

**He also told distributors of industrial chemicals to make sure that the chemicals followed the right path and destination.**

Anangwe: Public appeal

**The incident left 23 people dead, 22 hospitalised and one treated and discharged.**

# *How safe is 'cheap' alcohol for the poor?*

I read with interest the report that MPs had rejected several budget proposals. The one that captured my attention was the refusal to increase tax on fortified wines from 45 to 65 per cent.

The debate on this proposal was reduced to a defence of the Naivasha-based Keroche Industries, which manufactures fortified wines targeting the low end of the alcohol market.

In fact, Keroche had already gone to court to complain. The Finance minister, on the same day of raising excise tax on wine, including fortified wine, had also zero-rated non-malt beer sold in kegs to augment access to a safe alcoholic drink to low income Kenyans.

The court case, which has now been overtaken by events, was a complaint about how the two acts would operate in tandem.

The thrust of the argument by Keroche was that their fortified wine products have established themselves as "cost-effective, good quality and safe bottled alcoholic drinks" serving the very market the minister was seeking to assist.

**Legislators trivialised issues**

Raising excise tax on the one product, fortified wine, and zero-rating another, non-malt beer, while the two serve the same low end market, is what our MPs would seem to have resolved in favour of Keroche Industries. But in their debate, they trivialised issues that are much wider.

The increase was on wines, including fortified wine. I doubt that our MPs intended to protect wine imports in general for there would be no reasonable rationale for such action. Therefore, the loss of revenue from taxing other wines is totally unjustified.

We understand our MPs merely contrived to protect a local manufacturer of fortified wine on the logic that these products have been certified by the Kenya Bureau of Standards. If this certification is understood to mean that such products are, *ipso facto*, safe to drink, such logic is wide off the mark.

Alcohol, especially in high concentrations, is toxic to the body and is obviously "not safe". The body breaks down consumed alcohol as quickly as possible

**Enjoying a can of 'busaa': Traditional brews may become the preferred cheap drink of the future**

products from distilled products in any determination of how "safe" these products are to the body.

Fermentation is the primary process of producing alcohol in which sugar molecules derived from a variety of sources — barley, malted barley, wheat, maize, sorghum, grapes, sugar-cane or even sugar itself — are provided as food substrate to a family of organisms called yeast.

When yeast feeds on the food substrate, it produces ethyl alcohol as a "fortune" by-product of the fermentation process. Beer, *busaa* and wine are fermented products.

But after fermentation, a further process of refining alcohol is possible. This, essentially, involves heating the fermented morass under controlled conditions, collecting the resultant alcoholic vapour at specified temperature, cooling and bottling the liquid alcohol.

This process is called distillation. Gin, Vodka, and *chang'aa* are "spirits" in reference to the vaporisation stage during distillation.

Cheap liquor or any cheap distilled product is, by definition extremely dangerous. Fortified wine is made by arresting fermentation through the addition of raw alcohol. How much is added defines the potency of the product.

Finance minister Amos Kimunya's ration[illegible] as to

but extending similar rationale to reduce tax rates on any type of liquor would operate in the opposite direction.

Distilled liquor does not render itself well to the low end of the market precisely because liquor, in contrast to fermented brews, ought to be expensive to mitigate blatant alcohol abuse.

Therefore, if MPs thought that they were helping Keroche as a local enterprise, then they must also understand that they are aiding and abetting the gross consumption of dangerous levels of potent alcohol products on the cheap.

**Sustainable business model**

We would argue that the Government has a duty and an obligation to raise barriers against all distilled alcohol products.

Martel Brandy, no doubt, is certified by the Kenya Bureau of Standards as indeed by many other such institutions worldwide, but that is not to mean that we should strive to offer it as cheaply as possible to our citizens. There are very good reasons why MPs are not themselves Keroche customers!

The most successful companies are those that have the best sustainable business model. It is perfectly legitimate for East African Breweries Ltd to solicit for and obtain policy decisions to augment their entry into the low-end of the market, but the production of non-malt beer is not the exclusive preserve of any one company.

EABL sells distilled products too. Parliament ought to increase excise tax on liquor based products and reduce the same on fermented products. The market would then respond accordingly and, together, we shall save lives.

At the same time, and for the same reasons, we urge Parliament to urgently review the law prohibiting traditional African brews.

We have no doubt that these brews have their rightful role to contribute in the production, distribution and supply of safe, affordable alcohol at the low end of a well-regulated market place. It would also provide a valuable income-generating activity in poor urban and rural settings.

# *They're taxing the brewing industry dry*

When South African Breweries divested from Kenya after failing to achieve a critical market share, one of the main lessons missed was that the Government had miserably failed an investor who had shrugged off good advice and put his massive capital in Kenya.

If the international brewer had the option of closing down the operation at Thika, it is manifestly obvious that this rarely apply to us indigenous Kenyans who know no other home, even when it comes to investing.

That is why businesspeople braved the recession period of the late 1990s and early this decade.

That said, let me state from early on that the poor investment climate that nudged the South Africans out has not changed much, particularly qualitatively.

While the liquor industry in various ways employs up to 300,000 Kenyans, the fiscal regime does not seem geared to support either their continued stay in employment or generating more job opportunities.

Traditionally Government takes at least 60 per cent of the earnings by the liquor industry. This is a situation that is common globally.

As a matter of fact, that is one reason most governments throw a heavy protective wall around their alcohol industry. In countries like Germany through State encouragement has in excess of 1,000 liquor players and some more millions of hectolitres. The same thing applies in South Africa and Italy.

Where the Kenyan Government severely fails the industry is all thought-out heavy excise tax on *neutral alcohol*, an important input in the industry.

Kenya has the highest neutral alcohol excise duty in the region at nearly 300 per cent. In countries like Uganda, this is about 60 per cent. What this has meant is that companies have taken to sneaking in the liquid from across the borders, which has made it very difficult for the serious players to operate.

When importation of the neutral alcohol is made easier, we end up killing the local sugar industry.

Our vocal politicians, particularly from the sugarcane producing zones, do not appear as if they see the danger inherent in this.

Table sugar can only account for less than a third of the actual monetary yield of the sugarcane. As long as duty is not harmonised within the region, neutral alcohol will continue to be a top priority for smugglers: a situation which leaves Kenyan farmers dependent on erratic regional and global sugar prices.

Another fundamentally important point is that this uncontrolled flood of neutral alcohol has resulted in numerous informal players in the industry. As long as these players remain uncontrolled, the health of Kenyans remains outside the domain of the authorities. So does millions that should accrue to Treasury.

My fear here is that with a reported 60 players known to be operating in various forms, only about 10, including us, are on the radar of the Government. Yet products that are uncertified by Kenya Bureau of Standards and unknown to the Kenya Revenue Authority are in abundant supply, yet their brands are well displayed, vehicles conspicuously branded and a clear distribution network in place.

For the industry, it has meant competition has shifted to price instead of quality enhancement, making long-term prospects bleak. Where are the authorities?

Back to the original point of foreign investors and their shifting loyalties, it is imperative that the Government recognises that local investors are important in its long-term development planning. Without a well-grounded class of entrepreneurs, any industrial infrastructure is built on quicksand.

To give credit where it is due, the Narc Government has, to a large extent set out to disabuse Kenyans of the notion that foreigners are our saviours. Indigenous companies ranging from banks to manufacturers like us are at last gaining recognition. But more has to be done to "de-racialise" investment in the minds of Kenyans.

A multinational may pay employees more because they enjoy obvious economies of large production. But will they pay for the livelihood of all Kenyans?

Deliberate policy must be directed toward nurturing indigenous business, not derailing it.

As Finance minister Amos Kimunya embarks on putting final touches to the Budget, it is important that he recognises the internal strengths of this country and builds on them. Besides planning expenditure devoid of foreign aid, he must recognise that Kenyan enterprises have a lot of potential.

Drinking did not start yesterday. Kenyans will always drink. The challenge is to make these drinks affordable by fixing reasonable taxes considering the consumer, regulating all players and enforcing standards. That is all we serious players are asking for.

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*Mrs Karanja is the managing director, Keroche Industries Ltd*

# *They're taxing the brewing industry dry*

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*Mrs Karanja is the managing director, Kenya Breweries Ltd*

# Dutch beers in battle to win Kenyan hearts

By MWANIKI WAHOME

Two major Dutch beers are fighting for the throats of local tipplers, creating an intriguing face off in a market dominated by East African Breweries Limited

Although the contest is a bit on the fringes of Kenya's main beer market, the entry of Bavaria pitches against fellow premium Dutch brand, Heineken to which it plays second in the Netherlands.

Last year, Heineken sealed a deal with East African Breweries Limited to distribute their flagship Heineken Lager brand in Kenya and other countries in the region. The 1990s witnessed the most intense competition between beer brands when Castle Lager took on East African Breweries Limited (EABL) on its home turf

## Limped

However, things had largely settled in EBL's favour, after Castle limped out of the sector in a buy out deal that confined each to its market niche. EABL was left in Kenya while Castle Lager operates in Tanzania.

Jovet Kenya Limited, which holds the distributorship of the Bavaria brands in six countries of the region including Kenya, plans to ride on the crest of increased tourist volumes to spur their sales before eating into the market niche that has been largely the preserve of EABL.

Bavaria has a wide product range of 142 brands. The other countries to enjoy its brands are Tanzania, Democratic Republic of Congo, Rwanda, Burundi and Zambia

Jovet managing director, Daniel Munene, says the launch of the products on Friday in Mombasa was set to coincide with the tourism high season that spans from August to December.

"We are first targeting the tourists from Europe and America who already know the products and then slowly introduce the product to the market" he says.

However, he adds they were keen to penetrate the regional market with pilot surveys indicating that the two brands they put on the supermarket shelves in May were gaining a receptive client base.

Among the five products they have launched in the market are alcoholic and non alcoholic drinks. The non-alcoholic brands include Bavaria apple malt, Bavaria regular malt and 52 energy drink. The premium beer brands are Bavaria Holland beer and Bavaria Extra Strong. The brands that are packed in bottles and cans of 330 ml, 500 ml and 660 ml will retail at Sh90, Sh100 and Sh170.


**A selection of beers in a supermarket. The market is gearing up for a face-off between Dutch brands Bavaria and Heineken. The latter brand is distributed by Kenya Breweries Limited.**

**HE SAYS HE HAS SWEPT ASIDE THE FEARS EXPRESSED BY MANY PEOPLE THAT HE WILL BURN HIS FINGERS IN THE VENTURE.**

"We plan to tripple the sales in Kenya, from our target of 500,000 units in the first year, to 1.5 million units in the second year" he says.

Mr Munene adds that they were forced to extend their plans to appoint distributors from six months to one year, by the increase in excise tax during this year's budget. The excise tax for the imported brands was increased by Sh6 to Sh48 from Sh42.

But already the firm has employed 50 permanent staff with others being engaged on the need basis as marketing agents.

And Munene is not sanguine about the difficulties of penetrating the local beer market, that has for long eluded better endowed entities like Castle Lager. Other foreign brand that has not hit it rich in the local market is Windhoek.

He says he has swept aside the fears expressed by many people that he will burn his fingers in the venture.

Currently, EABL controls over 80 per cent of the local beer market. The company's 2002/03 financial report shows that alcohol consumption volumes have been on the decline at an annual rate of five per cent, with per capita consumption down from 11 litres to eight litres over 10 years.

But the downswing has reversed, according to the beer giant's 2005 financial report that indicates that alcohol consumption increased by 15 per cent, underpinned by the economic growth in the last three years.

EABL expects beer consumption to rise in tandem with the economy

"We would expect that with the economy showing signs of maintaining the growth momentum, this trend should continue. We believe that if the economy grew by the official projection of 5.8 per cent, consumption of total alcohol should grow in line with it," says the company in the report.

# Death toll from illicit beverage rises to six

By PASCAL MWANDAMBO

The death toll from a killer brew in Voi has risen to six.

Yesterday, leaders called for a crackdown on the illicit brewers in the district.

The six died at Moi Hospital after drinking *m'bangara* — suspected to have been laced with a chemical to increase its potency — at Mwambiti Village, Sagalla Location.

Addressing a Jamhuri Day rally at Moi Stadium in Voi Town, district officer Geoffrey Taragon, Voi mayor Priscillah Mwangeka and former area MP Basil Mwakiringo asked all those dealing in illicit brews to stop doing so to avert a repeat of similar tragedy.

Mr Taragon said it was unfortunate that a whole family had been wiped out by the killer brew.

The DO said chiefs had the obligation to eradicate illicit liquor brewing in their areas and warned those condoning it they would be sacked.

**Liquor is suspected to have been laced with a chemical**

"I understand some chiefs are accomplices in the illicit liquor business, and it's time they changed or else they will face the sack," Mr Taragon warned.

The administrator said he would meet all area chiefs today in his office to find out ways of eradicating the illicit trade.

Mr Taragon pointed out that there was need for local communities to work with the Provincial Administration to wipe out the killer drink.

Mr Mwangeka lamented that most families lived in poverty because men had abandoned their responsibility as breadwinners and left that role to their wives.

The leaders gave out the names of those who died after drinking the brew as Ngwale Mwambigu, Mwabwala Mwangena, Mwangala Mwangena, Mwangena Mwandembe, Haron Mwangena, Patrick Frank and Gilbert Laban.

# They are blind and want justice over killer brew

## Woman whose drink killed 50 people gets five-year jail term but some victims cry foul

By BOB ODALO

She wore a grey suit and a grave face. And when the magistrate spoke, she broke down in tears, pleading for mercy.

Although her arrest two years ago had attracted considerable public interest, only a handful were present in the Machakos courtroom where Francisca Kavoo was sentenced to five years for supplying lethal brew that killed 50 people.

The 42-year-old mother of two, better known as Mama Eric, was sentenced by Machakos chief magistrate Hellen Omondi for the deaths that shocked the nation at Kyumbi on the Nairobi-Mombasa highway.

In the 37-page judgment, the magistrate detailed the circumstances that had helped her arrive at the verdict, which some termed as too lenient.

### Release on bail

Ms Kavoo had been in custody for two years after the prosecution opposed her release on bail because she had been on the run after the tragedy.

She had served her customers the illicit brew known as mulika or kumikumi between June 24 and 25 in 2005.

The court ruled that the brew was laced with a high concentration of methanol, a deadly industrial solvent that is toxic as well as poisonous if inhaled or absorbed by the body through the skin.

Transferred Machakos district hospital superintendent Simon Mueke, said of the 56 who drank the brew, 50 made it to hospital where they died while undergoing treatment, which entailed administering whisky to neutralise methanol.

Dr Mueke told the court that the victims died a painful death as the lethal brew destroyed vital internal organs.

Ms Kavoo had denied the charges through Mr Bernard Mungata.

She said she had gone to visit a sick relative in Molo on June 24, 2005, when she was alleged to have sold the brew.

But her defence was quashed by her househelp who told the court that her boss actually supervised patrons as they bought and drank the brew.

"The brews were packed in small nylon papers, I was selling and Ms Kavoo was collecting the money," the househelp Mueni told the court.

Ms Kavoo tried to shift blame on Ms Mueni, saying she had no authority to sell the brew as "her work was that of a household."

In mitigation, Ms Kavoo said: "I have never killed in my life and there was nothing that could make me sell a drink that could cause deaths. The business was my source of livelihood."

State witness John Kinyanjui, a regular customer of Ms Kavoo's said: "After taking a few mugs sold by Mueni I realised it was unusually strong. I left Mama Eric's place for my house but honestly I cannot recollect how I reached there. I found myself in hospital the next day." Three of Mr Kinyanjui's drinking mates died.

Mr Francis Muoki, another witness, said the drink which was retailing at Sh40 was unusually strong. "When I realised its strong effect on my body, I decided to neutralise it by taking water but the more water I took the more drunk I became," he said.

Another witness shocked everyone when he told the court that he took drinks worth Sh70,000.

"I think the witness was still stupefied by the obviously strong methanol contents of the drink maybe he confused a mug of Sh40 for Sh70,000," said the magistrate.

Then there was the mystery of postmortem examination reports that were sent by post to the Machakos CID office but were yet to reach their destination, two years later.

CID officer Moses Mwangi said certified copies were sent by the government pathologist's office from Nairobi to his office but were yet to be delivered by yesterday.

Ms Kavoo maintained a studious silence throughout the session, her only expression coming when the five-year sentence was pronounced.

Her lawyer pleaded for a non custodial sentence. "She has two children, the first born dropped out of school to take care of the last born who is now in Form One. She (Kavoo) is her family's sole bread winner who is required to take care of her ailing mother and two orphan children left behind by her deceased sister," pleaded Mr Mungata.

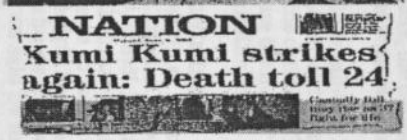
He said his client had developed high blood pressure and diabetes during the two-year detention and was still on treatment.

While sympathising with the accused's plight, Mrs Omondi said in view of what happened it would be unwise to give the accused a non-custodial sentence. "When I consider the pain left to families of the dead I sentence the accused to five years for each of the counts facing her and give her 14 days right to appeal," ruled Mrs Omondi.

That, in lay terms, would work out to one year for every 11 deaths caused by the lethal brew that Ms Kavoo sold. This appeared too lenient to Mr Thomas Musyoki, whose brother was blinded by the drink.

"Five years is too little. I was a bout as was earning some good money for my wife and two children, but I have been permanently blinded, I am a dependant now think she should have been killed the same way she killed 55 people," said Mr Jan Mutua Munywoki.

> I have never killed in my life and there was nothing that could make me sell a drink that could cause death: MAMA ERIC


NATION
Kumi Kumi strikes again: Death toll 24

**Top: Mr Kennedy Mutuku, a victim of the illicit brew that killed 50 people in Machakos two years ago, is examined at Kenyatta National Hospital, Nairobi; Above; how we reported the incident and, right; Francisca Kavoo, alias Mama Eric, who was jailed for five years yesterday for selling the killer brew.**
Photos: DAILY NATION

**2005**

**When the illicit brew killed 50 people in a village in Machakos**

# Chang'aa kills two children

## Leaders criticise move to lift ban as sellers in Migori make a fortune

By NATION Team

Two children have died after gulping chang'aa left behind by their mother.

The children, aged seven and three, were found unconscious and efforts to revive them at their home in Shitoto sub-location, Kakamega District, on Sunday failed.

The brother and sister were rushed to Eregi mission hospital but were pronounced dead on arrival. They are said to have removed the drink from where the mother had hidden it when she went to fetch water from a river. Their one-year-old sister is admitted to hospital.

Kakamega divisional police chief John Mwinzi said the 23-year-old woman had hidden the illicit brew in her house.

### Tragedy

The grief-stricken mother of two wept uncontrollably after learning of the tragedy that had befallen her children. The bodies have been taken to the Kakamega provincial hospital mortuary awaiting postmortem examination.

In the neighbouring Webuye District, a four-year-old girl drowned after she fell into a hole filled with water.

The girl was playing with her friends when she tripped and fell into the hol[illegible] said provincial police officer Peter K[illegible]a. Her body was retrieved and taken to Webuye hospital mortuary.

Elsewhere, the unbanning of traditional liquor has been criticised by Nandi leaders.

Agriculture minister Kipruto Kirwa and several Nandi leaders at the weekend condemned the decision. The minister said he would raise the matter with Finance minister Amos Kimunya.

### Sold their land

And speaking at a funds drive in aid of Nganiat Catholic Church in Emgwen Constituency, Nandi North District, ODM-K interim chairman Henry Kosgey called on Mr Kimunya to resign for lifting the ban. He said people had sold their land before when the liquor had been licensed.

Mr Kirwa said he fully supported calls by Mr Kosgey and other Nandi leaders that such a ban should not be lifted.

### Good business

He said despite being a minister in the Narc Government he could not support matters that were against his Nandi community.

Earlier in the meeting, Mr Kosgey led Kapsabet mayor Michael Rono, former MP Mark Too and Lieutenant General (Rtd) Augustine Cheruiyot in asking the Government to redegazette the ban.

At the same time, chang'aa brewers in Migori District have reported good business since the ban on traditional liquor was lifted.

They are selling several jerricans of the brew to their consumers in Kadika, Nyasare and Nyangubo estates with limited police harassment, they said.

And three civil servants were spotted lying by the roadside unconscious after

Mr Kosgey

> "If not checked, we may end up with a drinking nati[illegible]"

Witnesses said they had earlier been seen making merry at a local den with friends.

Mr Oloo Odari asked the Government to fix a time limit within which people can visit the dens, warning the brew may affect productivity at work place and stagnate economic growth.

"If not checked, we may end up with a drinking nation instead of a working one as desired by President Kibaki.

"Over-consumption of the liquor may lead to a serious moral decay if not regulated by the authorities," said Mr Odari, a businessman and a politician.

Chang'aa is popular mainly in Nyanza and Western provinces while muratina and busaa are popular in other parts of the country.

### Consumers taste

Brewers in south Nyanza had earlier welcomed the lifting of the ban, noting that the gesture showed that the administration of President Kibaki was sensitive to their economic plight and to the taste of the consumers.

Consumers, however, have asked the State to set minimum quality standards for preparing the brews to ensure they were fit for human consumption.

The legalisation of the local brews followed the repeal of the 36-year-old Traditional Liquor Act that criminalised the traditional manufacture of intoxicating liquor.

Under the new law assented to by President Kibaki, individuals and companies will be given wholesale or retail licences to make various brews and sell them according to the liquor licences.

*Reports by Benson Amadala, Tom Matoke and Elisha Otiang'a*

## Appendix B - Ethical Issues

### B.1 Ethical Consideration

All study participants were aged 18years and over and therefore legally eligible to consent.

Consent explanation was given before the participant gave consent. All aspects of detoxification including medication, dosage and side effects, right to withdraw at any time during study was explained after which consenting individuals signed a consent.

The patient was also informed of that they would be given three parenteral injections daily for three days by a qualified doctor assisted by a qualified nurse.

All the subjects joining the study underwent physical and mental state examinations. Those found to have severe medical conditions were referred to the doctor for medical treatment at the health centre. If the patient's condition could not be managed at the health centre, further referral along the laid down procedures was done. Those referred were however free to join the study after they recovered from the medical condition.

Patients found to have neuropsychiatric manifestations of alcohol abuse were not enrolled for the study but were referred to the health center psychiatric clinic and if necessary referred to the national referral hospital (Mathari).

Prophylactic treatment was done to prevent delirium tremens, alcohol withdrawal fits and wernickes encephalopathy. Delirium tremens develop in the first 2-3 days after alcohol withdrawal. Similarly persons may develop Wernickes-encephalopathy after alcohol withdrawal. These conditions can be disabling and literature available suggests that prophylaxis is essential. Along this, the following drugs were administered prophylactically; Pabrinex I & II parenterally daily for 3 days, was administered at the health centre facility where there were adequate resuscitation facilities in case of anaphylactic reaction to the drug, Diazepam (5mg), was given orally every night for 5 days for prevention of alcohol withdrawal seizures. Diazepam is also useful for insomnia related to alcohol withdrawal. The anticonvulsant Carbamazepine (200mg) was given for 10 nights to prevent alcohol withdrawal seizures.

These drugs are standard medication used for alcohol detoxification and there was no risk involved except the discomfort of injection.

The psychiatrist prescribed all the drugs and administered all the parenteraal injections. The participants were reviewed by the psychiatrist daily for the first 5 days thereafter every 2 days until the fourteenth day. This was to enable early detection of complications of alcohol withdrawal and their management.

Referral of all cases to the relevant hospital (as detailed above) that cannot be managed at the health center was done efficiently wherever necessary at any stage of the study. Only one participant required a 3 day admission after he developed a mild delirium tremens.

Confidentiality was assured at all times. The information about the subjects remained confidential and the data was coded. No identifiers would connect the participant to the data. All questionnaires were stored in locked cabinets that only the P.I had access to. The study was voluntary, there was no coercion and compensation of any kind was given to the participants. Individuals unwilling to continue with the rehabilitation were allowed to leave.

Permission was obtained from the following; Kenyatta National Hospital Ethical Committee, Administration of Kangemi Health Centre, Office of the President through the Ministry of Higher Education and Science and Technology.

## B.2 Confidentiality

The individual data obtained from the questionnaires was kept under custody of principal investigator and identified only by use of a serial number.
All outcomes had serial number the code of which was held only by the PI.
No individual information was reported that could be used to identify an individual.
Information obtained from the study subjects was unavailable to the group therapy members. This allowed group members to participate in group discussions only on issues they feel comfortable to discuss. In addition the group therapy meetings were voluntarily.

Although the CBHWs were already trained in collecting similar data in the community, retraining is planned before the commencement of the study. The main focus of the training was confidentiality and handling of study subjects and information obtained from them.

Individuals unwilling to continue with the rehabilitation will be allowed to leave; their details remained confidential.

## B.3 Benefits of the study to the patient

Treatment of outpatient basis at no cost.
Referral if found to have medical problems.
Detoxification within the community.
Scheduled visits at home and at the clinic.
Exposure to group therapy/self support social networks.

## B.4 Risks

None except pain associated with parenteral injection.

## B.5 Consent Explanation CBDR for Group

My name is Dr Mary Wangari Kuria; I am a psychiatrist and a lecturer at the department of psychiatry situated at Kenyatta National Hospital.

I am doing a study on the cost effectiveness of treating people with alcohol problems in their homes. I will also study how costly it is to be treated in a hospital or rehabilitation centre compared with treatment at home.

If we can establish that it is effective to treat people within their community, then this will make it possible to treat many of those people especially those who cannot afford hospital treatment.

I have identified you as one of the people I want to include in this study, and hereby request if you would be willing to do so. If you are not willing you will be treated and helped in the normal way. That is there will be no loss of benefits to you. If you agree and want to withdraw from the study at any stage, you may do so without loss of benefits.

If you agree to participate in the study we will ask you questions on your personal data, and administer some questionnaire to find out the pattern of your drinking and also any mental health problems. We will then give some medicines to take at home for ten days. You will also receive an intravenous injection once daily for 5 days at Kangemi Health Centre.

One of the staff from the Health centre, (a community based health worker) will come to visit you at your house twice a week, to assess how you are getting on. In addition you will visit the clinic once a week at the health center to be reviewed by the doctor. We will also ask you to meet bimonthly with other people going through the same process so that you can share your experience and help each other.

At the end of six months, we shall administer some tests to see the progress you have made. Thereafter you will be free to continue with the group meetings as per your group arrangements or to join any other group that would assist you to remain abstinent.

There will be no risks to you except the discomfort of the injection that you will receive. All information obtained from you as an individual will not be shared with others including your relatives; other people in the study group or anybody else, except the researcher and those directly involved in your care and only for purposes of assisting you. The completed questionnaires will not carry your name and only a serial number will be used for purposes of data analysis. They will be kept in the custody of the principal researcher and no other person will have access to them.

The community based health worker who will visit you twice a week is well trained and has been doing similar data collection from your community. Any information communicated to him or her will be treated confidentially and no body will know about it except those who will be involved in your care and only for purposes of helping solve your problems.

During the group meeting sessions no one will be compelled to contribute, it will be completely voluntary and you can chose to use a nickname. However active participation has been proven to be beneficial to other individuals with problems similar to yours and I would request you to be active. One of the group rules relates to members keeping group information secret and members will be expected to observe this and other rules that will be agreed on before group formation.

You will benefit from free treatment for your alcohol problem. However if we find other conditions that need attention we shall refer you to the Health centre for treatment and further referral if necessary. You will also benefit from company and sharing from the experience of others. Overall the study will benefit other people who have similar problems but cannot afford treatment in hospitals or rehabilitation centres. No compensation will be given for your participation.

If you have any questions you can call me on 0722 755681. You can also use the same number to get in touch with me regarding issues related to the study. In case there are any ethical questions that you feel should be addressed, you can contact the Kenyatta Hospital / University of Nairobi, Research and Ethical Committee on;

Telephone no. 726300-9 or
P.O Box 20723, Nairobi, Kenya

Thank you for your participation.

Dr Mary Wangari Kuria

## B.6 Consent Form (CBDR group)

I (serial No) ....., have understood the information about the research study and voluntarily consent to participate. I understand what my participation will involve, including possible risks, discomforts and benefits.

I understand the study is entirely voluntarily and I will not receive any payment for participating.

Signature...../ or right thumbprint. Date.....

Witnessed by..... Date.....

Interviewer (Name).....

Signature..... Date.....

## B.7 Consent Explanation for IBDR Group

My name is Dr Mary Wangari Kuria; I am a psychiatrist and a lecturer at the University of Nairobi, department of psychiatry located at Kenyatta National Hospital.

I am doing a study on the cost effectiveness of treating people with alcohol problems in their homes. I will also study how costly it is to be treated in a hospital or rehabilitation centre and compare it with treatment at home.

If we can establish that it is effective to treat people in their homes then this will make it possible to treat many of those people especially those who cannot afford hospital treatment.

I have identified you as one of the people I want to include in this study, and hereby request if you would be willing to do so. If you are not willing you will be treated and helped in the normal way. That is there will be no loss of benefits to you. If you agree and want to withdraw from the study at any stage, you may do so without loss of benefits.

If you agree to participate in the study we will ask you questions on your personal data, and administer some questionnaires to find out the pattern of your drinking and also any mental health problems. We will also ask questions regarding your last detoxification, and we are asking for permission to obtain details from the hospital, doctor, or relatives (if necessary) about the following, cost of detoxification and rehabilitation, duration and drugs used.

The information will remain confidential and the interviewer will not write your name on any of the questionnaire. It will therefore be impossible to identify the study subjects since only a serial number will be assigned to the completed questionnaires for purposes of data analysis. Individual information obtained from you will be held in confidence by the principal researcher and will not be divulged to any other person. This results will be compared with those of others been treated at home. Overall the study will benefit other people who have similar problems but cannot afford treatment in hospitals or rehabilitation centres. No compensation will be given for your participation.

If you have any questions you can call me on 0722 755681.

You can also use the same number to get in touch with me regarding issues related to the study. In case there are any ethical questions that you feel should be addressed, you can contact the Kenyatta Hospital / University of Nairobi, Research and Ethical Committee on;

Telephone no. 726300-9 or
P.O Box 20723,
Nairobi, Kenya

Thank you for your participation

Dr Mary Wangari Kuria

## B.8 Consent Form (IBDR group)

I.....,

(serial no.) ..... having been explained by.....

do hereby voluntary agree to participate in the study as explained. I also hereby give you consent to obtain details of my last detoxification from the hospital, relative or doctor who was treating me. I also understand that I can withdraw from the study without any loss of benefits.

Signed..... / Right Thumb print

Date.....

Name of interviewer.....

Date.....

Witness by.....

Signed.....

Date.....

## Appendix C- Budget

### C .1 Questionnaire Production

15 Pages X KSH 3.00 = 4500 x300 patients=13500

An extra 16x200patients xKsh3.00x6=19800

Cartridge 2@ 4,050 = 8100

Files 2@ 250 = 500

Telephone/ Scratch cards 20@ 1000 = 20,000

**Total amount =61900**

### C. 2 Data Management

Paper 8Rims @ 400 per ream =32,000

Internet / Computer 18 Months @ 10,000 per Month = 180,000

Cartridge 1@ 4050 = 4050

Pencils 5 pieces @ 20 = 100

Pens ½ dozen @ 300 = 300

Data entry 75 per questionnaire x300 = 22500

Data analysis @ 75,000

**Subtotal Amount = 313,950**

### C. 3 Report Writing

7 Copies @ 2000 per copy = 14,000

Transport to Kangemi KSH 30 x 10km x once a week for 18 Months = 2160

**Total Amount = 22,560**

Daily allowance for P.I four times a month for 18months 21 X 2000 = 75600

Allowance for CBHW=213280

**Subtotal= 327600**

## C. 4 Detoxification (CBDR)

Medication

Pabrinex X100packsX3600X5daysX200patients = 360,000

Diazepam 5mg, 1000tablets @150 = 150

Carbamezapine 200mg, 1000tablets @ 2000 = 2000

Syringes and needles 1000 @10 = 10,000

**Subtotal=372150**

## C. 5 Alcohol Analysis

Cost of alcohol= 3000

14 Samples @3000 = 42000

Labour= 1000

**Subtotal= 46000**

## C.6 Other costs

Approval/ Permit Fees= 3000

Field Visits By Supervisors= 10,000

**Grand Total Amount = 1095600**

## Appendix D- Questionnaires

### D.1.The WHO Alcohol Use Disorders Identification Test (AUDIT) Interview Version

Please tick the answer that is correct for you.

**1. How often do you have a drink containing alcohol?**

(0) Never (Skip to Qs 9 – 10)
(1) Monthly or less
(2) 2 to 4 times a month
(3) 2 to 3 times a week
(4) 4 or more times a week

**2. How many drinks containing alcohol do you have on a typical day when you are drinking?**

(0) 1 or 2
(1) 3 or 4
(2) 5 or 6
(3) 7, 8 or 9
(4) 10 or more

**3. How often do you have six or more drinks on one occasion?**

(0) Never
(1) Less than monthly
(2) Monthly
(3) Weekly
(4) Daily or almost daily

Skip to Question 9 and 10 if Total score for Questions 2 and 3 = 0

**4. How often during the last year have you found that you were not able to stop drinking once you had started?**

(0) Never
(1) Less than monthly
(2) Monthly
(3) Weekly
(4) Daily or almost daily

**5. How often during the last year have you failed to do what was normally expected from you because of drinking?**

(0) Never
(1) Less than monthly
(2) Monthly
(3) Weekly
(4) 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?**

(0) Never
(1) Less than monthly
(2) Monthly
(3) Weekly
(4) Daily or almost daily

**7. How often during the last year have you had a feeling of guilt or remorse after drinking?**

(0) Never
(1) Less than monthly
(2) Monthly
(3) Weekly
(4) Daily or almost daily

**8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?**

(0) Never

(1) Less than monthly

(2) Monthly

(3) Weekly

(4) Daily or almost daily

**9. Have you or someone else been injured as a result of your drinking?**

(0) No

(2) Yes, but not in the last year

(4) Yes, during the last year

**10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?**

(0) No

(2) Yes, but not in the last year

(4) Yes, during the last year

## D.2.The Alcohol, Smoking and Substance Involvement Screening and Test (ASSIST)

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

| **Q2 – Q5 tick: 0=Never, 1=once or twice, 2=Monthly, 3=Weekly 4=Daily or almost daily** | | | | | |
|---|---|---|---|---|---|
| In the past 3 months, how often have you used the substances you mentioned? | **0** | **1** | **2** | **3** | **4** |
| Tobacco products (cigarettes, chewing tobacco, cigars, etc.) | | | | | |
| Alcoholic beverages (beer, wine, spirits, changaa, (kumi kumi.) | | | | | |
| Caffeine | | | | | |
| Cannabis (marijuana, pot, grass, hash, bhang) | | | | | |
| Cocaine (coke, crack, etc.) | | | | | |
| Amphetamine type stimulants (speed, diet pills, ecstasy, Khat/Miraa ) | | | | | |
| Inhalants (nitrous, glue, petrol, paint thinner, etc.) | | | | | |
| Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, ) | | | | | |
| Hallucinogens (LSD, acid, mushrooms, PCP, Special K, ) | | | | | |
| Opioids (heroin, morphine, codeine, Brown sugar) | | | | | |
| Other - specify: | | | | | |
| During the past 3 months, substance you have mentioned in Q1 how often have you had a strong desire or urge to use them? | | | | | |
| Tobacco products (cigarettes, chewing tobacco, cigars, etc.) | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Alcoholic beverages (beer, wine, spirits, changaa, (kumi kumi.) | | | | | |
| Caffeine | | | | | |
| Cannabis (marijuana, pot, grass, hash, bhang) | | | | | |
| Cocaine (coke, crack, etc.) | | | | | |
| Amphetamine type stimulants (speed, diet pills, ecstasy, Khat/Miraa ) | | | | | |
| Inhalants (nitrous, glue, petrol, paint thinner, etc.) | | | | | |
| Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol,) | | | | | |
| Hallucinogens (LSD, acid, mushrooms, PCP, Special K, ) | | | | | |
| Opioids (heroin, morphine, codeine, Brown sugar) | | | | | |
| Other - specify: | | | | | |
| During the past 3months, how often has your use of drugs mentioned in question Q1 led to health, and social, legal or financial problems? (**Specify the four leading drugs).** | **0** | **1** | **2** | **3** | **4** |
| **Health Problems (specify the four leading drugs).** | | | | | |
| Drug i) | | | | | |
| Drug ii) | | | | | |
| Drug iii) | | | | | |
| Drug iv) | | | | | |
| **Social Problems (specify the four leading drugs).** | | | | | |
| Drug i) | | | | | |
| Drug ii) | | | | | |
| Drug iii) | | | | | |
| Drug iv) | | | | | |
| **Legal Problems (specify the four leading drugs).** | | | | | |
| Drug i) | | | | | |
| Drug ii) | | | | | |
| Drug iii) | | | | | |
| Drug iv) | | | | | |
| **Financial (specify the four leading drugs).** | | | | | |
| Drug i) | | | | | |
| Drug ii) | | | | | |
| Drug iii) | | | | | |
| Drug iv) | | | | | |

| During the past 3 months, how often have you failed to do what was normally expected of your because of your use of: **(specify the four leading drugs).** | | | | | |
|---|---|---|---|---|---|
| Drug i) | | | | | |
| Drug ii) | | | | | |
| Drug iii) | | | | | |
| Drug iv) | | | | | |

| **Q6-Q8 Tick 0=No, never, 1=Yes, but not in the past 3 months, or 2=Yes in the past 3months** | | | |
|---|---|---|---|
| Has a friend of relative or anyone else ever expressed concern about your use of drug **(If yes specify the four leading drugs).** | **0** | **1** | **2** |
| Drug i) | | | |
| Drug ii) | | | |
| Drug iii) | | | |
| Drug iv) | | | |
| Have you ever tried to control, cut down or stop using drug **(If yes specify the four leading drugs).** | | | |
| Drug i) | | | |
| Drug ii) | | | |
| Drug iii) | | | |
| Drug iv) | | | |
| Have you ever used any drug by injection (non-medical use only) **(If yes specify the four leading drugs).** | | | |
| Drug i) | | | |
| Drug ii) | | | |
| Drug iii) | | | |
| Drug iv) | | | |

## D.3. Social Demographic Data Questionnaire (SDQ)

1. Name----------Age in Years
2. Sex---------- 1=Male 2= Female
3. Specify your marital status (Tick correct one)
4. Single Married Polygamous Cohabiting Separated Divorced
5. 4. Religion (Tick correct one)
6. Protestant Catholic Muslim Other specify
7. If married what does your spouse do for a living
8. What is the highest level of education that you have achieved?
9. What is your occupation?
10. Total number of children
11. How many children do you have that are less than 18 years?
12. What is your monthly income?
13. Do you suffer from any chronic or recurrent illness?
14. If yes specify
15. Have you been on treatment for the said illness?
16. If so specify the nature of treatment
17. Have you been to any form of alcohol rehabilitation?
18. If so, state when and where.....
19. What was the period of stay in the said rehabilitation?
20. Do you have any medical insurance cover or any private medical insurance cover?

    1= Yes 2= No

21. If yes specify the maximum amount covered by your insurance
22. If no how do you meet the costs of your treatment
23. Do you have any difficulties in meeting the costs of your treatment?

    1= Yes 2= NO

Residence: ..... Estate.....

Place of work..... Tel. no.....

House: Number..... Tel: Number.....

Next of Kin: Name ..... Relationship.....

Telephone.....

Sub location.....

Chief.....

Sub chief Name.....

District.....

Put a tick next to the statements that apply to you (may be more than one)

1) At what age did you start using substance of abuse?
2) Who introduced you to drugs?
   - Peers ☐
   - Friend ☐
   - Parent (s) ☐
   - Other siblings ☐

   Others.....specify
3) Why do you take drugs?
   - The Drug (s) are easily available ☐
   - Was curious to find out the effect of drugs ☐
   - Poor parentage (brought up badly by patients) ☐
   - Peer pressure and fitting in with another group of people ☐
   - To escape problems they may be having in other parts of their lives ☐
4) Why do you continue taking drugs?
   - Gives me company from friends ☐
   - Keeps away loneliness and sadness ☐
   - Helps me ran away from my problems ☐
   - Influence by my friend ☐
   - To avoid withdrawal effects ☐
   - Believe there is nothing wrong with using drugs. ☐

## D.4 CBDR Follow-Up Questionnaire (CBHW Administered)

**Research serial number**

**Week..... Month..... Year.....**

1. In the last one-week have you used alcoholic beverages (beer, wine spirits chang'aa Kumikumi)?

   Yes =1 No =2

If answer to 1 is No skip question 2 if yes, how often have you used alcoholic beverages (beer wines, spirits, and chang'aa) in the last one-week?

2. How much on average do you drink on once occasion?
3. Have you had a strong desire or urge to use alcoholic beverages (beer wine, spirits chang'aa, Kumikumi)
4. What challenges are you experiencing since you stopped using alcohol?
5. Do you have any of the following symptoms?
   I. Tremors
   II. Headache
   III. Vomiting
   IV. Nausea
   V. Lack of sleep
   VI. Craving for alcohol
   VII. Loss of memory
   VIII. Hearing voices of people you can't see (auditory hallucinations)
   IX. Seeing objects or things that others cannot see (visual hallucinations)
   X. Feeling sad
   XI. Getting annoyed easily
   XII. Fits (convulsion)
   XIII. Confusion
   XIV. Other symptoms specify

## D.5. CBDR Follow-up Questionnaire (PI Administered)

**Research serial number**.....

**Week**..... **Month**..... **Year**.....

1. For how many weeks have you been in the study?
2. Have you drunk alcohol since you joined the last one week?
3. If you yes, how much have you drunk on each occasion?
4. Do you have any of the following symptoms (tick those that are present)?
   I. Tremors
   II. Headache
   III. Vomiting
   IV. Nausea
   V. Lack of sleep
   VI. Craving for alcohol
   VII. Loss of memory
   VIII. Hearing voices of people you can't see (auditory hallucination)
   IX. Seeing objects or things that others cannot see (visual hallucinations)
   X. Having low mood
   XI. Irritability
   XII. Restlessness
   XIII. Convulsion
   XIV. Confusion
   XV. Feeling withdrawn
   XVI. Suicidal ideas
   XVII. Hopelessness
   XVIII. Pains/aches (specify)
   XIX. Other symptoms (specify)

5. Do you still desire to continue with the study?

## D.6. IBDR Follow-up Questionnaire (PI administered)

My name is psychologist /Dr Kuria,

Is that so and so?

I'm calling from rehabilitation x (name), to enquire the progress of participant A (name of participant).

Since discharge from the rehabilitation has he/she drank alcohol

a) If yes is, he /she drinking alcohol,
b) Same as before rehabilitation
c) Less than before rehabilitation
d) More than before
e) Others

Please tell him to get in touch with in case of any need. Thank you

## D.7. WMH-CIDI PAPI Interview

*IWER NAME _____

*IWER ID.....

*Sample ID .....

*DATE: DAY..... MNTH..... YR.....

**SCREENING SECTION (SC)**

*SC0.4. EXACT TIME NOW: HR..... MIN.....

*SC1. The first few questions are for background purposes. How old are you?

INTERVIEWER: RECORD AGE ON **REFERENCE CARD, SCREENING SECTION**.

_____ YEARS OLD

DON'T KNOW..... 998

REFUSED..... 999

*SC1.1. INTERVIEWER QUERY

R IS A MALE.....1

R IS A FEMALE .....2

*SC2. How long have you lived at your current address?

_____ NUMBER

CIRCLE UNIT OF TIME: DAYS...1 WEEKS...2 MONTHS...3 YEARS...4

DON'T KNOW .....998

REFUSED.....999

*SC3. Are you currently married, separated, divorced, widowed or never married?

MARRIED.....1 **CHECK *SC3 ON REFERENCE CARD, THEN GO TO *SC4.1**

SEPARATED .....2

DIVORCED.....3

WIDOWED .....4

NEVER MARRIED .....5

DON'T KNOW .....8

REFUSED.....9

*SC3a. Are you currently living with someone in a marriage-like relationship?

YES.....1 **CHECK *SC3a ON REFERENCE CARD**

NO.....5

DON'T KNOW.....8

REFUSED.....9

*SC4.1. INTERVIEWER CHECKPOINT: UNIT OF MEASUREMENT FOR HEIGHT

IMPERIAL/US..... 1

METRIC..... 2 **GO TO *SC4b**

*SC4. How tall are you?

_____ (FEET)

_____ (INCHES) **GO TO *SC5.1**

DON'T KNOW..... 998

REFUSED..... 999

***SC4b.** How tall are you?

_____ (CENTIMETERS)

DON'T KNOW..... 998

REFUSED..... 999

***SC5.1.** INTERVIEWER CHECKPOINT: UNIT OF MEASUREMENT FOR WEIGHT

IMPERIAL/US..... 1

METRIC..... 2

*SC5. How much do you weigh?

_____ (POUNDS or KILOGRAMS)

DON'T KNOW..... 998

REFUSED..... 999

*SC7. Are you a current smoker, ex-smoker, or have you never smoked?

CURRENT.....1 **CHECK *SC7 CODED '1' ON REFERENCE CARD**

EX-SMOKER.....2 **CHECK *SC7 CODED '2' ON REFERENCE CARD**

NEVER .....3

DON'T KNOW .....8

REFUSED.....9

*SC8.1 How would you rate your overall physical health -- excellent, very good, good, fair, or poor?

EXCELLENT.....1

VERY GOOD.....2

GOOD.....3

*SC9. Compared to one year ago, would you rate your health in general now as much better than one year ago, somewhat better, somewhat worse, or much worse now than one year ago?

MUCH BETTER NOW .....1

SOMEWHAT BETTER NOW.....2

(IF VOL) ABOUT THE SAME.....3

SOMEWHAT WORSE NOW.....4

MUCH WORSE NOW .....5

DON'T KNOW .....8

REFUSED.....9

*SC19. The next questions are about health problems you may have had at any time in your life. It is important for the research that you think carefully before answering. Are you ready to begin?

INTERVIEWER: R IS REQUIRED TO RESPOND. IF NOT, EXPLAIN RATIONALE AND REPEAT.

ATTEMPT TO RESCHEDULE FOR MORE CONVENIENT TIME IF "YES" RESPONSE CANNOT BE ELICITED

YES .....1
NO .....5
DON'T KNOW .....8
REFUSED .....9

| INTERVIEWER: READ FOLLOWING QUESTIONS SLOWLY | **YES (1)** | **NO (5)** | **DK (8)** | **RF (9)** |
|---|---|---|---|---|
| ***SC20.** Have you ever in your life had an attack of fear or panic when all of a sudden you felt very frightened, anxious, or uneasy? | 1 **CHECK *SC20 ON REF CARD THEN GO TO SC20.1** | 5 | 8 | 9 |
| ***SC20a.** Have you ever had an attack when all of a sudden you became very uncomfortable, you either became short of breath, dizzy, nauseous, or your heart pounded, or you thought that you might lose control, die, or go crazy? | 1 **CHECK *SC20a ON REF CARD** | 5 | 8 | 9 |
| ***SC20.1.** Have you ever had attacks of anger when all of a sudden you lost control and broke or smashed something worth more than a few dollars? | 1 **CHECK *SC20.1 ON REF CARD** | 5 | 8 | 9 |

| | | | | |
|---|---|---|---|---|
| *SC20.2. Have you ever had attacks of anger when all of a sudden you lost control and hit or tried to hurt someone? | 1<br>**CHECK *SC20.2 ON REF CARD THEN GO TO *SC21** | 5 | 8 | 9 |
| *SC20.3. Have you ever had attacks of anger when all of a sudden you lost control and threatened to hit or hurt someone? | 1<br>**CHECK *SC20.3 ON REF CARD** | 5 | 8 | 9 |
| *SC21. Have you ever in your life had a period lasting several days or longer when most of the day you felt sad, empty or depressed? | 1<br>**CHECK *SC21 ON REF CARD** | 5 | 8 | 9 |
| *SC22. Have you ever had a period lasting several days or longer when most of the day you were very discouraged about how things were going in your life? | 1<br>**CHECK *SC22 ON REF CARD** | 5 | 8 | 9 |
| *SC23. Have you ever had a period lasting several days or longer when you lost interest in most things you usually enjoy like work, hobbies, and personal relationships? | 1<br>**CHECK *SC23 ON REF CARD** | 5 | 8 | 9 |
| *SC24. Have you ever had a period lasting four days or longer when you became so happy or excited that you either got into trouble, people worried about you, or a doctor said you were manic? | 1<br>**CHECK *SC24 ON REF CARD** | 5 | 8 | 9 |
| *SC25. Have you ever had a period lasting four days or longer when most of the time you were very irritable, grumpy, or in a bad mood? | 1<br>**CHECK *SC25 ON REF CARD** | **5<br>GO TO *SC26** | 8<br>**GO TO *SC26** | 9<br>**GO TO *SC26** |

| | | | | |
|---|---|---|---|---|
| ***SC25a.** Have you ever had a period lasting four days or longer when most of the time you were so irritable that you started arguments, shouted at people, or hit people? | 1<br>**CHECK *SC25a ON REF CARD** | 5 | 8 | 9 |
| ***SC26.** Did you ever have a time in your life when you were a "worrier" – that is, when you worried a lot more about things than other people with the same problems as you? | 1<br>**CHECK *SC26 ON REF CARD THEN GO TO *SC27** | 5 | 8 | 9 |
| ***SC26a.** Did you ever have a time in your life when you were much more nervous or anxious than most other people with the same problems as you? | 1<br>**CHECK *SC26a ON REF CARD THEN GO TO *SC27** | 5 | 8 | 9 |
| ***SC26b.** Did you ever have a period lasting one month or longer when you were anxious and worried most days? | 1<br>**CHECK *SC26b ON REF CARD** | 5 | 8 | 9 |

INTERVIEWER: READ FOLLOWING QUESTIONS SLOWLY. FOR EACH 'YES' RESPONSE, CHECK ITEM ON REFERENCE CARD, *SC27-*SC27f.

***SC27.** (RB, PG 1) The next questions are about things that make some people afraid even though they know there is no real danger. Looking at page 1 in your booklet, was there ever a time in your life when you had a strong fear of any of the following things?

| | **YES (1)** | **NO (5)** | **DK (8)** | **RF (9)** |
|---|---|---|---|---|
| *SC27a. First, bugs, snakes, dogs, or any other animals? | 1 | 5 | 8 | 9 |
| *SC27b. Second, still water, like in a swimming pool or a lake, or weather events, like storms, thunder, or lightning? | 1 | 5 | 8 | 9 |
| *SC27c. Third, going to the dentist or doctor, getting a shot or injection, seeing blood or injury, or being in a hospital or doctor's office? | 1 | 5 | 8 | 9 |
| *SC27d. Fourth, closed spaces, like caves, tunnels, closets, or elevators? | 1 | 5 | 8 | 9 |
| *SC27e. Fifth, high places like roofs, balconies, bridges, or staircases? | 1 | 5 | 8 | 9 |
| *SC27f. Sixth, fear of flying or of airplanes? | 1 | 5 | 8 | 9 |

*SC28. INTERVIEWER CHECKPOINT (SEE ***SC27a - *SC27f**):

AT LEAST ONE RESPONSE CODED '1'.....1 **CHECK *SC27a - *SC27f ON**

**REFERENCE CARD**

ALL OTHERS.....5

| INTERVIEWER: READ FOLLOWING QUESTIONS SLOWLY. | | | | |
|---|---|---|---|---|
| | **YES (1)** | **NO (5)** | **DK (8)** | **RF (9)** |
| ***SC29.** (RB, PG 2) Looking at page 2 in your booklet, was there ever a time in your life when you felt very afraid or really, really shy with people, like meeting new people, going to parties, going on a date, or using a public bathroom? | 1 **CHECK *SC29 ON REF CARD THEN GO TO *SC30** | 5 | 8 | 9 |
| ***SC29a.** Was there ever a time in your life when you felt very afraid or uncomfortable when you had to do something in front of a group of people, like giving a speech or speaking in class? | 1 **CHECK *SC29A ON REF CARD** | 5 | 8 | 9 |
| ***SC30.** (RB, PG 2) Looking at the bottom of page 2 in your booklet, was there ever a time in your life when you had a strong fear of either being in crowds, going to public places, traveling alone, or traveling away from home? | 1 **CHECK *SC30 ON REF CARD** | 5 | 8 | 9 |

*SC31. The next question is about concentration problems that usually start before the age of seven. These problems include not being able to keep your mind on what you were doing, losing interest very quickly in games or work, trouble finishing what you started without being distracted, and not listening when people spoke to you. During your first years at school—say between the ages of 5 and 7 -- was there ever a period lasting six months or longer when you had a lot more trouble with problems of this sort than most children?

YES .....1 **CHECK *SC31 ON REFERENCE CARD**

NO.....5

DON'T KNOW .....8

REFUSED.....9

*SC32. Some young kids are very restless and fidgety and so impatient that they often interrupt people and have trouble waiting their turn. Did you ever have a time before the age of seven lasting six months or longer in your childhood when you were like that?

INTERVIEWER: IF ONLY IN THIRD GRADE OR LATER, CODE 'NO'.

YES .....1 **CHECK *SC32 ON REFERENCE CARD**

NO.....5

DON'T KNOW .....8

REFUSED.....9

*SC33. Did you ever have a period lasting six months or longer during your childhood or adolescence when you frequently did things that got you in trouble with adults such as losing your temper, arguing or talking back to adults, refusing to do what your teachers or parents asked you to do, annoying people on purpose, or being touchy or irritable?

YES .....1 **CHECK *SC33 ON REFERENCE CARD, THEN GO TO *SC33.1**

NO.....5

DON'T KNOW .....8

REFUSED.....9

*SC33.1. Many children and teenagers go through periods when they do things adults don't want them to do, like lying, stealing, or breaking rules. Did you ever go through a period during your childhood or teenage years when you did any of these things?

YES .....1 **CHECK *SC33.1 ON REFERENCE CARD, THEN GO TO *SC34**

NO.....5

DON'T KNOW .....8

REFUSED.....9

*SC33.2. Did you ever go through a period as a child or teenager when you either broke into cars, set fires, or destroyed property on purpose?

YES .....1 **CHECK *SC33.2 ON REFERENCE CARD, THEN GO TO *SC34**

NO.....5

DON'T KNOW .....8

REFUSED.....9

*SC33.3. When you were a child or a teenager, did you ever run away from home, or repeatedly play hooky from school, or often stay out much later at night than you were supposed to?

YES .....1 **CHECK *SC33.3 ON REFERENCE CARD**

NO.....5

DON'T KNOW .....8

REFUSED.....9

***SC34.** Some children have difficulty with separation from their parents or other family members. Examples include getting very upset when they are away from these people, worrying a lot that something bad will happen to separate these people from them, or wanting to stay home from school or not go other places without them. Did you ever have problems like this for a month or longer during your childhood?

YES .....1 **CHECK *SC34 ON REFERENCE CARD**

NO.....5

DON'T KNOW .....8

REFUSED.....9

*SC35. Some people have difficulties with separation from family members, romantic partners, or close friends. Examples include getting very upset when they are away from this person, worrying a lot that this person might leave them, and being too "clingy" or dependent. Did you ever have a period lasting one month or longer when you had problems like this?

YES .....1 **CHECK *SC35 ON REFERENCE CARD**

NO.....5

DON'T KNOW .....8

REFUSED.....

## D.8. Training Manual for CBHW

**Contents of training**

1.1. Introduction

1.2. Definitions of terms

1.3. Classification of substances of abuse.

1.4. Alcohol as a drug

1.5. Complications of alcohol abuse and related disorders

1.6. Diagnosis of alcohol dependence

1.7. Standard drink

1.8. Management of alcohol dependence

1.9. Purpose of current stud

1.10. Identifying a person with alcohol dependence

1.11. Questionnaires to be used.

1.12. Procedure for follow up of study participants..

1.13. Role of CBHW.

1.14. Ethical considerations

## Definition of Terms

### DRUG OR SUBSTANCE

A drug is any chemical substance or a mixture of substance which when introduced in to the living organism may modify one or more of its function.

### DRUG ABUSE

Drug abuse is persistence and/or excessive use of a drug inconsistent with or unrelated to medical practice, resulting to harmful effects.

This harmful effects may be physical, mental social or otherwise.

### DRUG MISUSE

This is unsanctioned or illegal use of drug i.e. the society or group within the society does not sanction the use of the drugs.

### DEPENDENCE

Drug dependence is an emotional and sometimes a physical need experienced by a drug abuser. The drug abuser feels a compulsion to take the drug on a regular basis to feel its effect to avoid the discomfort of its absence.

### TOLERANCE

The repeated use of a drug leads to changes in the brain and nervous system so that the user needs more of the drug in order to get expected results.

Tolerance develops when the person has been taking the drugs regularly and in sufficient doses over a period of time.

Once the person stops taking the drug the tolerance is lost. Cross-tolerance can occur between drugs with similar mechanisms of action.

## Classification of drugs

### Depressants

These are substances that suppress the central nervous system

This includes

1. Alcohol
2. Pethidine,
3. Morphine
4. Heroine
5. Tranquillizers

### Stimulants

These are substances that stimulate the CNS and includes;

1. Caffeine,
2. Amphetamines,
3. Khat,
4. Tobacco,
5. Cocaine
6. Methylphenidate.

### Hallucinogens

These are substances that have the ability to cause hallucinations. They include

1. Lysergic Acid Diethyl amine (LSD)
2. Phencyclidine
3. Ecstasy
4. Mescaldine.

### Cannabis

This drug which delivered from marijuana plant produces a combination of effects to the central nervous system.

It has a depressant and stimulant effect as well as hallucinogenic properties.

**Alcohol**

Alcohol is the most abused drug in most parts of the world. In different parts of the world it is sold by different names.

The use of alcoholic has been on the increase over the world men use/ abuse alcohol more than women although this gap in the sex ratio has been narrowing.

The highest percentage of active alcohol users is the age group of 20-30 years.

## Theories on Etiology

### Genetic and biological

Data strongly indicates a genetic component in at least some forms of alcohol related disorders. Many studies have shown that persons with first degree relatives affected with an alcohol related disorder are three to four times more likely to have an alcohol related disorder than persons without affected first degree relatives.

### Behavioral and learning factors

Habits within the family specifically the parental drinking habits can affect drinking in their children.

Positive reinforcing aspects of alcohol contribute to excessive drinking of alcohol. Positive reinforcement induces feelings of well-being and Euphoria, which contribute to repeated use of alcohol.

### Social and cultural factor

Social settings may contribute to excessive drinking of alcohol. Some social setups that have been thought to be associated with excessive alcohol intake include the military bases and college dormitories.

In this setup excessive drinking and frequent drinking are considered to be a normal and expected behavior.

Some cultural and ethnic groups are more restrained than others about alcohol consumption. For example the Asian and conservative Protestants use less alcohol, as do the liberal Protestants and catholic persons. In some ethnic groups alcohol use is normal among certain age groups.

Factors that contribute to use of alcohol

### Easy accessibility

When the drug is accessible then the person is more likely to abuse the drugs.

**Peer pressure**

Most of the people using alcohol (and also other substance of abuse) receive the first drink free of charge from the peer group. Peer pressure is an important factor not only leading individual to begin use of alcohol but also in sustaining use of alcohol.

**Poor parentage**

Learning through modeling occurs in children where they do as their parents do.

**Media influence**

Advertisement of alcohol portrays it as a drink worth trying. Among the youth media influence causes they do begin using alcohol.

**Sex**

The cultural setup is more permissive when it comes to men drinking. Men also have more leisure time than women who have various scores to keep them busy. Until recently African man handled all financial matters. Due to this financial ability males abuse alcohol more than females.

## Complications of alcohol abuse

### Dependence

In 1964 the W.H.O concluded that the term addiction is no longer a scientific term and recommend substituting the term with drug dependence.

Dependence may be psychological or physical dependence.

Psychological dependence is also called habituation and is characterized by a continuous or intermittent craving for the substance in order to avoid a dsyphoric state. In physical dependence there are physiological effects of multiple alcohol use, mainly tolerance and withdrawal symptoms.

Signs of Dependence

### Tolerance

The person requires an increasing amount of alcohol to produce the same effect as previously used doses of alcohol.

### Withdrawal syndrome

The person develops symptoms when he has not taken alcohol.

### Primacy

Alcohol takes primacy over other activities including, employment, business, and family education etc.

### Stereotyped pattern of use

There is a regular pattern of use of the drug to avoid withdrawal syndrome.

### Relieve drinking

The person takes alcohol to relief the withdrawal symptoms.

### Reinstatement after period of abstinence

There is a quick reinstatement to full drinking once the person resumes drinking.

The substance use is continued despite knowledge of having persistent or recurrent physical or psychological complications.

## Complications of alcohol abuse and dependence

This can be divided into

Medical

Social

Physical

Medical complications

They may involve any part of the body.

Liver

Cirrhosis

Fatty liver

Liver cancer

Hepatitis

Brain

Dementia

Convulsions

Reproductive system

Females Fetal alcohol syndrome

Infertility

Males Impotence

Increased libido due to disinhibition but reduce inability to perform

Temporarily reduces sperm count and mobility

For both females and males sexually transmitted diseases e.g. HIV may occur due to disinhibition.

Cardiovascular diseases

Hypertension

Cerebrovascular accidents

Heart diseases

Metabolic disorders

Hypoglycemia

Diabetes

Neurological and psychiatric complications

- Korsarkoff psychosis
- Alcoholic hallucination
- Anxiety disorder
- Depression
- Suicide
- Pathological jealousy
- Cognitive impairments
- Brain damage
- Paranoid states
- Social complication
- Divorces/separation
- Battering wife/husband
- Child abuse
- Unemployment, loss of job
- Economic hardship
- Crime
- Antisocial

**Diagnosis**

Alcohol use Disorder identification test (AUDIT) has been found to be a reliable instrument in detention of alcohol abuse and dependence. It has a high degree of sensitivity and specificity. It is not influenced by cultural background.

The range of score is 0-40 points.

0 points indicate a person who has never used alcohol while 40 points for the severely alcohol dependent person.

**Standard Drink**

In different countries, health educators and researchers employ different definitions of a standard unit or drink because of differences in the typical serving sizes in that country. For example,

1 standard drink in Canada: 13.6 g of pure alcohol

1 standard drink in the UK: 8 g

1 standard drink in the USA: 14 g

1 standard drink in Australia or New Zealand: 10 g

1 standard drink in Japan: 19.75 g

Kenya (a former British colony) employs the UK definition of a standard drink.

**Management**

Management of alcohol dependence involves 5 steps.

1. **Diagnosis**

Assessment of the person does not only involve assessment of severity but also the complications brought about by alcohol.

2. **Detoxification**

Once the alcohol dependent alcohol withdraws from alcohol, symptoms of various severities develop.

The withdrawal symptoms may be treated by use of Benzodiazepines e.g. Diazepam, has been also used. Parenteral Vitamin B combination is important in preventing severe withdrawal symptoms. Carbamazepine, which is an anticonvulsant drug, is also useful in preventing ram fits.

The three drugs will be used in the study as follows:

1. Diazepam 5mg every night of 5 nights after detoxification.
2. Carbamazepine 200mg every night for 10 nights after detoxification.
3. Vitamin B and C combination (pabrinex I& II) given intravenously for 3 days.

Adverse effects to medications;

The side effects to the above medications are few. Diazepam and carbamazepines may cause drowsiness and one should avoid operating moving machines including driving.

Detoxification may be done as outpatient or inpatient. In the current study it will be done on outpatient basis at kangemi health center.

**3. Treatment of complication**

Any complication arising from use of alcohol should be attended to.

**4. Rehabilitation**

Alcohol dependent persons require rehabilitation after detoxification. There are two types, institution based and community-based rehabilitation. The institution-based rehabilitation requires admission to a rehabilitation center for 30 days while in community based; the client is followed up in the community. In the current study, community based detoxification will be done and clients will be followed up in the community for a period of six months. A structured follow-up questionnaire will be used

**5. Psychotherapy**

Psychotherapy is an important tool in the management of alcohol dependent persons. Various forms of Psychotherapy that may be done including;

i. Behaviour therapy.
ii. Individual therapy.
iii. Family therapy.
iv. Group therapy.
v. Cognitive therapy.
vi. Brief intervention.

In the current study group therapy will be done every 2nd Sunday at the Kangemi hall (schizophrenic foundation).

**Purpose of current study**

The aim of the study is to determine the cost effectiveness of treating people with alcohol problems in their homes. The researcher will also study how costly it is to be treated in a hospital or rehabilitation center compared with treatment at home.

**Identifying a person with alcohol dependence**

Persons that are known to use alcohol daily and to have social financial, legal or medical problems related to alcohol are likely to be alcohol dependent. These are the people you will approached and inform them about the study. Fill the Alcohol use Disorder identification test (AUDIT) questionnaire, and female clients who score 13 and above and males who score 15 and above qualify to join the study. Invite them to the Kangemi health center for recruitment for the study.

**Questionnaires to be used and how to collect data**

1. Socio demographic questionnaire
2. AUDIT
3. ASSIST
4. CIDI
5. Follow up questionnaires

Community based health workers were made to understand the contents of each questionnaire and its use in the study with particular emphases on the AUDIT and follow up questionnaire. The training also included a discussion of the items on the follow up questionnaires and how and when to fill up the follow up.

**Outline of Role of CBHW**

1. Identification of alcohol dependent persons
2. Approach the persons that are known in the village or estate to be alcoholic (*mulevi*) and explain to them or their relatives that they can obtain treatment for their alcohol problem.
3. Explain to the relatives and or the person the treatment procedure.
4. If they accept invite participant to come to Kangemi Health center any morning between Monday and Friday at 9.00am
5. Accompany them to the clinic on the appointed date
6. Follow up of the study participants into the community and progress reporting.
7. Visit by the CBHW twice a week and the follow up questionnaire filled on each visit (those that do not wish to be followed will not be forced).

## Ethical Consideration

It is important to act as ethically as possible. The following are a few ethical guidelines

Introduce your self to the alcohol dependent person or their relatives.

Obtain consent from the person to explain to them your purpose for visit. If they decline don't force them.

The person should understand the purpose of the study and what is expected of them as stipulated in the consent explanation (see appendix).

Those that refuse to join study should not be forced or persuaded. Remember the person must participate in the study voluntarily and can leave at any stage of the study.

Any information received from study participant will be handled in confidentiality.

Follow up forms should contain the serial number of the client for identification purposes and should be handed to the principal investigator once filled.

No payment will be requested for, or received from the study participants.

## Appendix E- Research Approval Documents

KENYATTA NATIONAL HOSPITAL
Hospital Rd. along, Ngong Rd.
P.O. Box 20723, Nairobi.
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP", Nairobi.
Email: KNHplan@Ken.Healthnet.org

Ref: KNH-ERC/ 01/ 4507

3rd July 2007

Dr. Mary Wangari Kuria
Dept. of Psychiatry
School of Medicine
University of Nairobi

Dear Dr. Kuria

REVISED RESEARCH PROPOSAL: "COST EFFECTIVENESS OF COMMUNITY BASED AS COMPARED TO INSTITUTION BASED DETOXIFICATION AND REHABILITATION OF ALCOHOL ABUSERS: BRIDGING RESEARCH POLICY AND TREATMENT" (P61/5/2007)

This is to inform you that the Kenyatta National Hospital Ethics and Research Committee has reviewed and approved your above revised research proposal for the period 3rd July 2007 – 2nd July 2008.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimen must also be obtained from KNH-ERC for each batch.

On behalf of the Committee, I wish you fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of database that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely

PROF. A.N. GUANTAI
SECRETARY, KNH-ERC

c.c. Prof. K.M. Bhatt, Chairperson, KNH-ERC
The Deputy Director CS, KNH
The Dean, School of Medicine, UON
The Chairman, Dept. of Psychiatry, UON
Supervisors: Prof. D.M. Ndetei, Dept. of Psychiatry, UON
Prof. Isodore Obot, School of Public Health & Policy, Morgan State University

# MINISTRY OF SCIENCE & TECHNOLOGY

Telegrams: SCIENCE TEC", Nairobi

Fax No.
Telephone: 318581
When replying please quote

REPUBLIC OF KENYA

JOGOO HOUSE
HARAMBEE AVENUE ,
P. O. Box 9583-00200
NAIROBI
KENYA

MOST 13/001/37C 231/2

9th April 2007

Dr. Mary Wangari Kuria
University of Nairobi
P.O. Box 30197
NAIROBI

Dear Madam,

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on, *'Cost Effectiveness of Community Based as Compared with Institution Based Detoxification and Rehabilitation of Alcohol Abusers: Bridging Research Policy and Treatment'*

I am pleased to inform you that you have been authorized to carry out research in Nairobi for a period ending 30th August 2008.

You are advised to report to the Provincial Commissioner, the Provincial Director of Education and the Provincial Medical Officer of Health Nairobi before embarking on your research project.

On completion of your research, you are expected to submit two copies of your research report to this office.

B. O. ADEWA
FOR: PERMANENT SECRETARY

Copy to:

The Provincial Commissioner
Nairobi

The Provincial Director of Education
Nairobi

The Provincial Medical Officer of Health
Nairobi

PAGE 2

THIS IS TO CERTIFY THAT:

Prof./Dr./Mr./Mrs./Miss. MARY WANGARI KURIA

of (Address) UNIVERSITY OF NAIROBI P.O. BOX 30197 NAIROBI

has been permitted to conduct research in

Location,

NAIROBI District,

NAIROBI Province,

on the topic COST EFFECTIVENESS OF COMMUNITY BASED AS COMPARED WITH INSTITUTION BASED DETOXIFICATION AND REHABILITATION OF ALCOHOL ABUSERS: BRIDGING RESEARCH POLICY AND TREATMENT

for a period ending 30TH AUGUST, 2008

PAGE 3

Research Permit No. MOST 13/001/37C 231

Date of issue 8.5.2007

Fee received SHS.1000.00

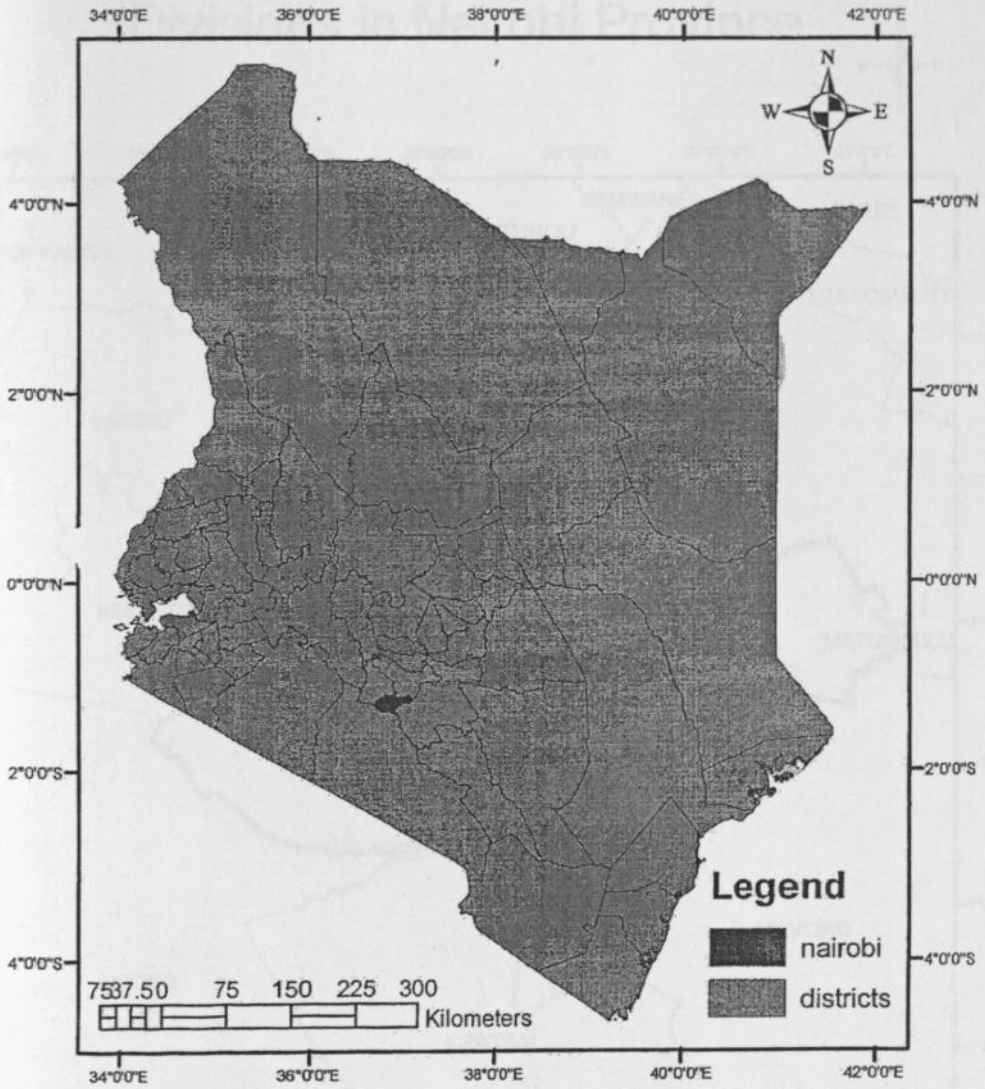
Applicant's Signature

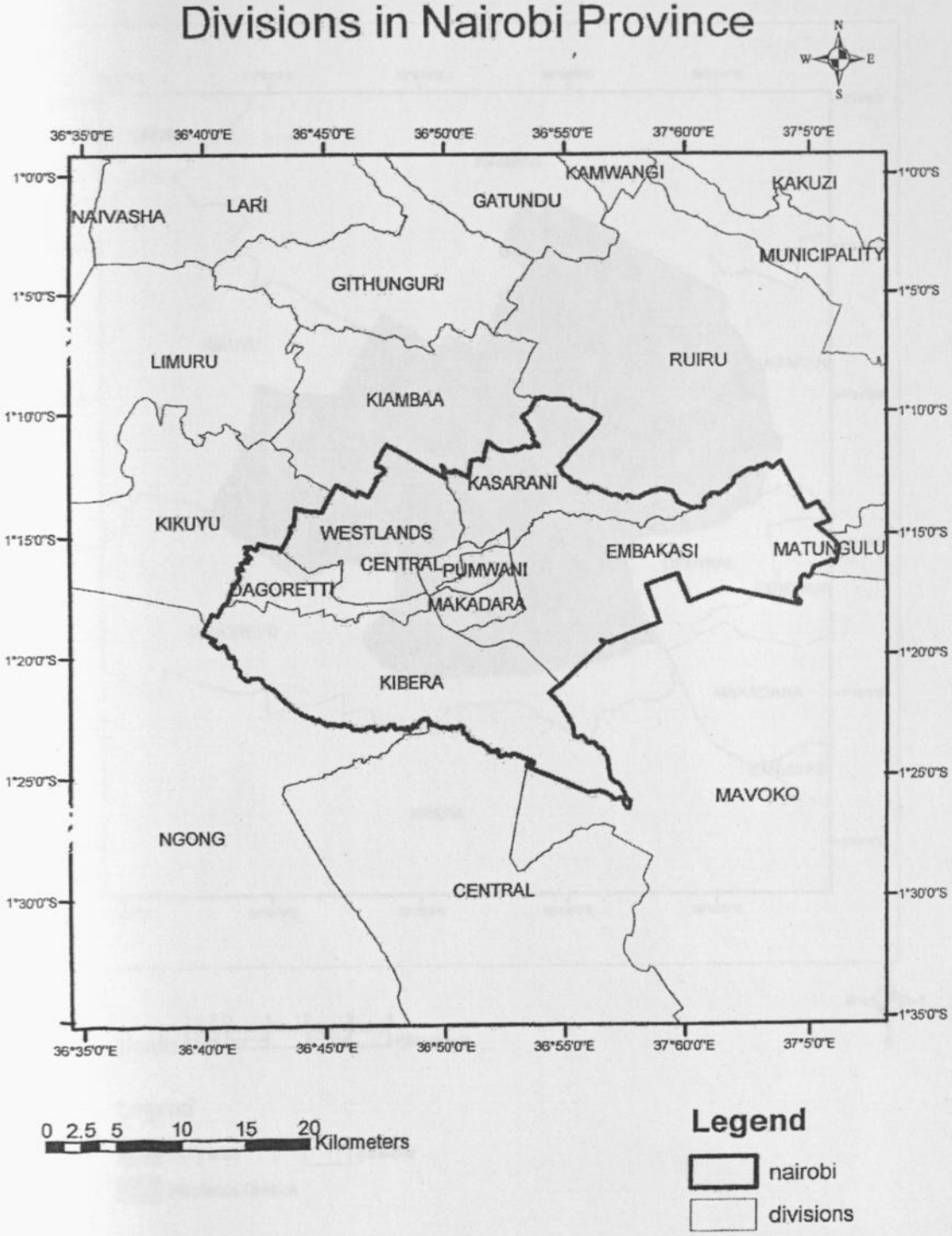
B.O. ADENA

FOR: Permanent Secretary
Ministry of
Science and Technology

## Appendix F- Maps

# Nairobi province in the Kenya Map




Divisions in Nairobi Province
N
W
E
S
36°35'0"E
36°40'0"E
36°45'0"E
36°50'0"E
36°55'0"E
37°60'0"E
37°5'0"E
1°0'0"S
1°5'0"S
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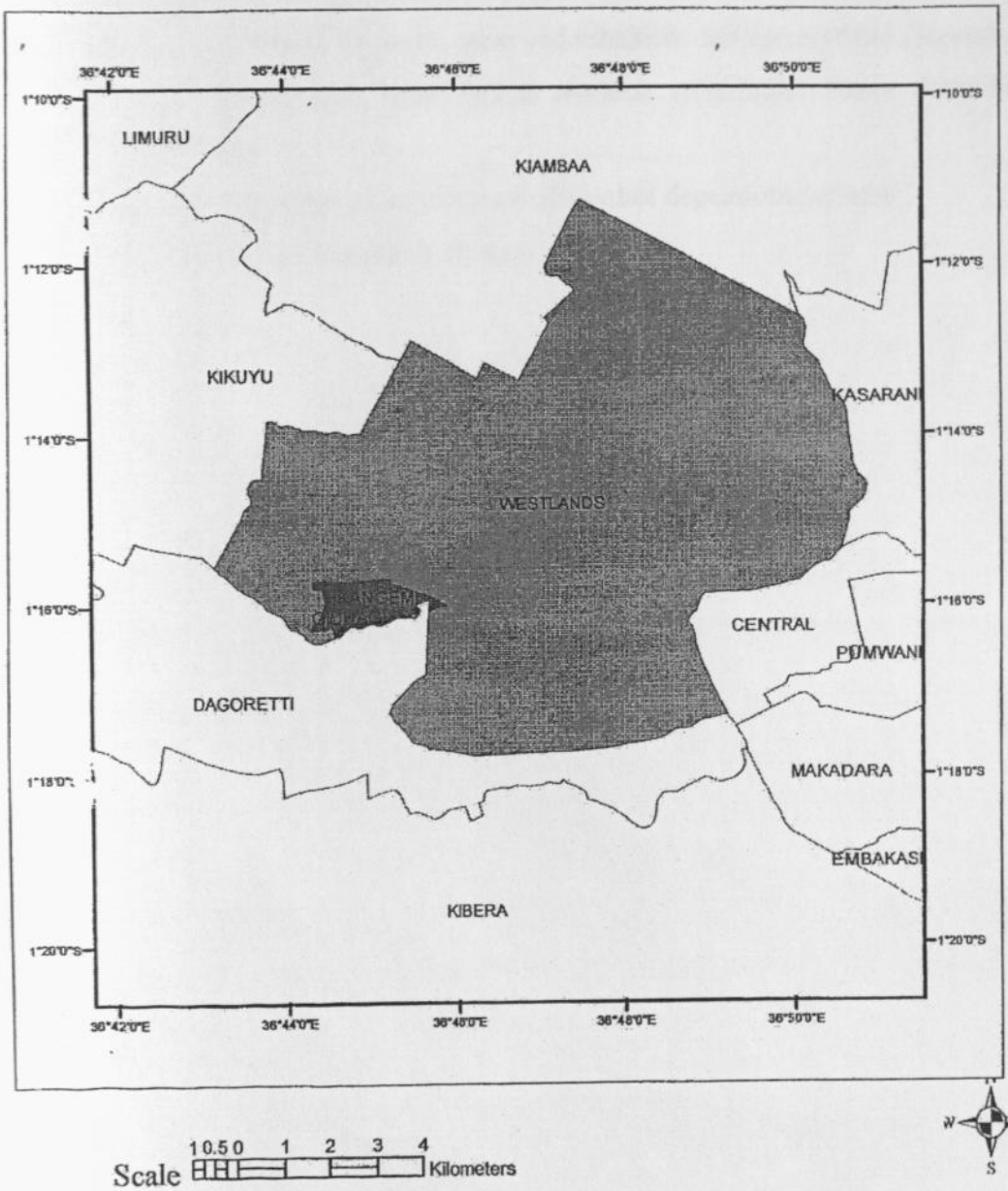
1°15'0"S
1°20'0"S
1°25'0"S
1°30'0"S
1°35'0"S
KAMWANGI
KAKUZI
NAIVASHA
LARI
GATUNDU
MUNICIPALITY
GITHUNGURI
LIMURU
RUIRU
KIAMBAA
KASARANI
KIKUYU
WESTLANDS
EMBAKASI
MATUNGULU
CENTRAL
PUMWANI
DAGORETTI
MAKADARA
KIBERA
MAVOKO
NGONG
CENTRAL
0 2.5 5 10 15 20
Kilometers
Legend
nairobi
divisions

## Map of Westlands Division and the Study area.



## Papers under preparation for publication

1. Chemical composition of alcoholic brews in Kangemi, Kenya
2. Cost Effectiveness of Community Based as Compared to Institution Based
3. Community Based Detoxification and rehabilitation for Alcohol Dependent Persons
4. Role of Community based health workers community based detoxification and rehabilitation
5. Socio demographic characteristics of alcohol dependent persons
6. Reasons why people drink alcohol