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Examining The Effectiveness of Community-based DE-Addiction Camps among Adults with Alcohol Problems in Rural India

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Recommended Citation

FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

EXAMINING THE EFFECTIVENESS OF COMMUNITY-BASED

DE-ADDICTION CAMPS AMONG ADULTS WITH ALCOHOL

PROBLEMS IN RURAL INDIA

A dissertation submitted in partial fulfillment of

the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

SOCIAL WELFARE

by

Meenal J. Sawant

2017

To: Dean Tómas Guilarte
    Robert Stempel College of Public Health and Social Work

This dissertation, written by Meenal J. Sawant, and entitled Examining the Effectiveness of Community-based De-Addiction Camps among Adults with Alcohol Problems in Rural India, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Date of Defense: November 3, 2017

The dissertation of Meenal J. Sawant is approved.

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Dean Tómas Guilarte
Robert Stempel College of Public Health and Social Work

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Andrés G. Gil
Vice President for Research and Economic Development
and Dean of the University Graduate School

Florida International University, 2017

DEDICATION

This Dissertation is dedicated to my parents and husband. Mom, Dad, and Prashant -

thank you for your love, support and continuous encouragement.

ACKNOWLEDGMENT

ABSTRACT OF THE DISSERTATION

EXAMINING THE EFFECTIVENESS OF COMMUNITY-BASED

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Professor Eric F. Wagner, Major Professor

India has reported higher alcohol per capita consumption and problem use in the past.

Per the 2005-06 NFHS-3, problem use has been disproportionately high among men,

less educated people, those living in rural areas and lower socioeconomic groups.

Despite the growing problem, the data available on the effectiveness alcohol

treatment services is very limited. The proposed study intends to address this gap by

analyzing the treatment outcome (i.e., complete abstinence) among adult users

participating in de-addiction camps and the impact of various individual and

environmental factors on alcohol use and treatment outcome. Data (N=176) was

collected on adult alcohol users participating in treatment camps conducted in

Manjakkudi village of Tamil Nadu between 2004 and 2009 by the T.T. Ranganathan

Clinical Research Foundation (TTK center), a renowned non-profit organization.

Treatment outcome and impact of various factors (AOI, ACEs, religiosity, family h/o

addiction, other drug use, and relationship with family members) on the baseline

alcohol use and outcome was analyzed using the advanced statistical methods of

Structural Equation Modeling. As expected, heavy alcohol use was common among the sample. Almost 44% of the sample reported consuming 12 standard drinks per day. In addition, 83% of the patients scored high on the SADD scale indicating high alcohol dependence. Nearly, half (49%) of the population had a positive history of family addiction and more than half of the sample (66%) reported one or more ACEs. Nearly, 68% of the patients reported being sober at the end of 12 months' post treatment. A total number of ACEs and supportive relationships with family members were found to influence the treatment outcome. Consistent with the literature, AOI was found to be associated with baseline alcohol use. By contrast, alcohol use was found to be higher among those who reported no tobacco use. Findings of this study indicate that trends of substance abuse are shifting in India and it is important to tailor the education and preventive efforts towards a younger population. In addition to patients, treatment providers should consider educating friends and family members to increase the support during the treatment process and guarantee long-lasting treatment effects

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CHAPTER I: INTRODUCTION

Alcohol use in developing countries

Harmful alcohol use has been reported as one of the top five risk factors for disease, disability and death throughout the world (World Health Organization, 2011). In 2013, nearly 6% of all deaths worldwide (i.e. 3.3 million) and more than 200 diseases and injuries were attributed to harmful alcohol use (http://www.who.int/mediacentre/factsheets/fs349/en/). In general, developed nations have reported higher alcohol per capita consumption and problem use in the past. However, according to the recent United Nations Office of Drug and Crime's (UNODC) World Drug Report (2015), there has been a rapid increase in alcohol and drug use in developing nations. In addition, a recent World Health Organization's Global Status Report (WHO-GSR) has also noted a dramatic increase in the average per capita consumption of alcohol in South-East (SE) Asia (i.e., Bangladesh, Bhutan, Korea, India, Indonesia, etc.) and Western Pacific regions (i.e., Australia, Fiji, Japan, Philippines, Vietnam, China, etc.) between years 2003/05 and 2008/10. Moreover, within the SE Asia region, the average adult alcohol per capita consumption of India (4.3 litres of pure alcohol) was reported to be higher than the average consumption of the entire region, 3.5 litres of pure alcohol; (World Health Organization, 2014).

Problem alcohol use in India

India is one of the largest developing economies in the world. Due to its sheer population size (2nd highest population in the world, exceeding one billion), India contributes largely to the global burden of diseases including those caused due to problem alcohol use. Though mild/moderate use of alcoholic beverages has always been accepted by certain castes in India, socio-political changes in India in the past two decades have led to unprecedented

growth (106% increase) in problem alcohol users. According to the 2005-06 National Family Health Survey (NFHS-3), the most recent national survey on alcohol use in India, problem use was disproportionately high among men, less educated people, those living in rural areas and lower socioeconomic groups (International Institute for Population Sciences (IIPS) and Macro International, 2007).

India faces other challenges, besides increased use, when it comes to alcohol. For instance, although alcohol use is still a male phenomenon, recent studies have reported a gradual increase in the rates of women and young users in India (Chari, Shereena, Chand, & Suman, 2012; Kimuna, Djamba, Ciciurkaite, & Cherukuri, 2013; Shrivastava & Shrivastava, 2013). Some epidemiological studies have also found that the drinking patterns of Indian users are changing rapidly from mild/moderate to heavy episodic drinking. Heavy drinking has become so common that some researchers have referred to it as a "signature drinking pattern" of India (Prasad, 2009). In addition, recent studies have noted consistent drop in the age of drinking initiation, and changes in individual and societal attitudes towards drinking leading to severe negative alcohol consequences in this population (Benegal, 2005).

Problem alcohol use has affected almost every sector in India, including health, social and financial, causing a huge toll on an already weak infrastructure of the country. Both increased consumption and heavy drinking have been linked to higher rates of alcohol use disorders (AUDs). Additionally, alcohol use among Indians has also been associated with several serious negative consequences: i) physical problems such as esophageal and liver cancers, liver cirrhosis, diabetes, heart diseases, spread of HIV infection, tuberculosis; ii) psychological problems such as depression, suicidal attempts and high rates of suicide; and iii) social issues such as family disturbances, homicide, high crime rate, domestic violence,

sexual abuse and road traffic accidents in India (Benegal, Velayudhan, & Jain, 2000; Benegal, 2005; Benegal, 2009; Girish, Kavita, Gururaj, & Benegal, 2010; Jeyaseelan et al., 2007; Srinivasan & Augustine, 2000). It is important to note that damage caused by such consequences is much higher in developing nations like India compared to developed countries due to high rates of poverty and unemployment, low education, rapidly changing social and political environment, and limited treatment resources (Uchtenhagen, 2004).

De-addiction treatment in India

At present, alcohol treatment in India is primarily provided by the government through three main channels- a) specially established substance abuse treatment centers or de-addiction centers (i.e. center-based care); b) district level hospitals and medical centers (i.e. hospital-based/inpatient care); and c) community clinics or Primary Health Care Centers (PHCs). In addition, few private psychiatric clinics and non-profit organizations also provide detoxification treatment in limited areas. Most of these treatment centers are located near cities or big towns, except the PHCs that provide primary care in rural areas. Despite such efforts, studies have shown that few alcohol users in India receive adequate treatment (Ray, 2004), mostly due to lack of awareness regarding alcohol consequences and/or treatment availability. Gururaj and colleagues (Gururaj, Girish, & Benegal, 2006) reported that more than half (53.3%) of the alcohol users (n= 3258) in their study did not feel the need of treatment, and among those who did, nearly 30% neither made personal efforts nor were advised by any healthcare professionals to reduce their drinking. In addition, majority users living in rural and underserved areas remain untreated due to barriers such as location of treatment centers, hospitalization and travel costs, time constraints, fear of treatment, and social stigma.

De-addiction camps

To address such barriers, the Indian government along with some non-profit organizations began offering community-based treatment services, known as "*de-addiction camps*" in the rural areas. However, since the concept of alcohol treatment itself is comparatively new in India, studies examining the "treatment effectiveness" of these camps are scant. Some preliminary studies have found de-addiction camps to be culturally sensitive, cost-effective, and better than rural hospital based care (Chavan & Arun, 1999; Chavan, Gupta, Raj, Arun, & Chanderbala., 2003; Chavan & Gupta, 2004; Cherian, 1989; Ranganathan & Cherian, 1994). Nonetheless, these studies have several limitations such as non-experimental study designs, lack of statistical power due to small sample sizes, lack of standardized measures to assess outcomes, and/or lack of advanced statistical techniques to corroborate the results. This highlights an urgent need for strong evidence-based alcohol interventions that would fit the cultural needs of this population.

Purpose of the Research

The proposed study intends to address these gaps by examining the treatment effectiveness of "de-addiction camps" among adult alcohol users from rural areas in India. The primary goal of this study is to assess the treatment outcome (i.e., complete abstinence) among adult users participating in de-addiction camps. In addition, the impact of various individual and environmental factors was examined for alcohol use and treatment outcomes among this population. Data (N=176) was obtained from the T.T. Ranganathan Clinical Research Foundation (TTK center), Chennai, a renowned non-profit organization in Southern India. TTK has been conducting treatment camps among rural and underserved parts of Southern India since 1989. The sample included clients who received de-addiction treatment through six different camps conducted in the Manjakkudi village of Tamil Nadu between

2004 and 2009. Treatment outcome, i.e., proportion of clients reporting complete abstinence at the end of 12-months, and impact of various risk and protective factors on the outcome were analyzed using the advanced statistical methods such as the Structural Equation Modeling (SEM).

Research Aims

This goal was achieved by addressing the following aims:

AIM 1: Given the paucity of de-addiction camp data, the first aim of this study was to explore the background characteristics of the sample population. Specifically, I examined the demographic characteristics (i.e., age, religion, marital, educational and employment status, as well as monthly income), social characteristics (i.e., religiosity, relationship with family members, family h/o addiction and ACEs), drinking habits (i.e., quantity, frequency and beverage type, age of initiation, alcoholism symptoms) and other drug use among this population. The demographic characteristics of the current study population was further compared with the national alcohol users' data available from the 2003 World health survey published by the World Health Organization to determine the resemblance between these populations.

AIM 2: To examine the association between baseline alcohol use and various individual and environmental factors. The strength of the relationship between baseline drinking and age of initiation of alcohol use, ACEs, religiosity, family h/o addiction, other drug use, and relationship with family members will be examined in-depth.

AIM 3: To determine the influence of individual and environmental factors on treatment outcome (i.e., period of sobriety at the end of 12-months).

CHAPTER II: Literature Review

Introduction

The current study is designed based on the information learned from an extensive literature search carried out through various databases. Studies examining alcohol prevalence rates, drinking patterns, various risk and protective factors associated with problem alcohol use, alcohol-related consequence and treatment services among adult alcohol users in India were searched through EBSCOhost, Cambridge Scientific Abstract (CSA), ISI Web of Knowledge, CINAHL, AgeLine, CINAHL Plus with Full Text, Race Relations Abstracts, Social Work Abstracts, Health and Psychosocial Instruments, FRANCIS, Criminal Justice Abstracts, eBook Collection (EBSCOhost), Social Sciences Full Text (H.W. Wilson), Applied Social Sciences Index and Abstracts (1987-present), Education Resources Information Center (ERIC, 1966-current), PsycInfo (1806-current), Social Services Abstract (1979-current), Sociological Abstracts (1952-current), Science Citation Index Expanded (SCI-EXPANDED, 1977-present) and Social Sciences Citation Index (SSCI, 1977-present). PubMed, OVID, Cochrane library and Campbell Collaboration databases were also searched for peer-reviewed articles, systematic reviews and meta-analyses. Reports published by WHO and United Nations (UN) were referred to identify alcohol and treatment studies in India. Lastly, the reference lists of relevant articles were searched to identify additional studies.

Studies were searched using combination of keywords such as "alcohol*," "alcohol drinking," "substance use," "substance-related disorders," "alcohol-related disorders," "alcohol use disorder," "addiction," "intoxication," "problem drinking," "risks," "factors," "treatment*," "therapy*," "therapeutics," "intervention," "prevention," "services," "India," or "Asia, Western." Boolean operators such as "AND" and "OR" were used to link search terms

together. The wildcard character * was used to truncate terms in order to include all forms of particular root words. Relevant studies identified through this search were reviewed critically to gain in-depth understanding of alcohol problems in India.

Results revealed that alcohol research in India is still in a primitive stage. The recent national statistics for alcohol use were available from the National Family Health Survey (NFHS-3) conducted by the Ministry of Health and Family Welfare with the help of International Institute for Population Sciences, Mumbai, during 2005-06 among a representative sample from all 29 states of India that included 124,385 women and 74,369 men between ages 15 and 54 years (International Institute for Population Sciences (IIPS) and Macro International, 2007). Most studies examining prevalence, drinking patterns, risk and protective factors, and alcohol consequences were carried out on local samples from different regions. India is a country with 29 states and 7 union territories, 4 main religions (Hindus, Muslims, Christians and Sikhs), 14 official languages and diverse cultures. These cultural and regional differences were reflected in population alcohol use. For instance, in a study conducted to determine standard measurements for alcoholic drinks at three different locations (Delhi, Goa and Rajasthan) in India, Nayak and colleagues (2008) observed that a standard "peg" for spirits and country liquors at outlets in Delhi and Rajasthan was described as 40 ml whereas that in Goa was 60 ml. In contrast, when inquired at social gatherings in Delhi for pour size of a "peg" several respondents showed the level on a glass that was equivalent to 60 ml. Due to such differences as well as methodological variations, it is difficult to generalize the findings of these studies. However, given the paucity of data, efforts have been made to identify the similarities between studies while summarizing the

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information, at the same time, pointing out their diversities whenever relevant. Findings are discussed in following sections.

History of Alcohol Use in India

Alcohol use in India can be dated back to several centuries (Mahdihassan, 1984; H. Sharma, Tripathi, & Pelto, 2010; Vaswani, Ambekar, & Pattanayak, 2009). The history of alcohol use can roughly be divided in four major eras of Indian civilization. *Vedic* and post-*Vedic* (BC 1700 – 550 AD) era is the earliest known period in Indian history. During this era, a group of people from central Asia, known as *Aryan's*, migrated to the Indian subcontinent and composed the oldest scriptures (i.e, "*Vedas*") that formed the base of Hindu religion. Mild/moderate consumption of low-ethanol containing beverages was accepted among certain *castes* ("a hierarchy of endogamous groups that individuals enter only by birth" as defined by (Olcott, 1994) during this period. This was followed by the medieval and post-medieval period (AD 550 – 1800) when the Muslim rulers invaded India and left a strong influence of their beliefs and cultures on indigenous people. Alcohol became a general commodity and part of social lives during this era. However, religious bindings and strict regulations prevented it from being misused (H. Sharma et al., 2010; Vaswani et al., 2009).

Colonial era (AD 1800 – 1947; (H. Sharma et al., 2010; Vaswani et al., 2009) was the period when drastic changes were observed in drinking patterns and social attitudes towards drinking among Indian people. Alcohol industry was controlled entirely by the British government. Low-ethanol containing beverages were replaced by strong factory-made drinks. Locally produced country liquors were banned from the market. Legal sale of alcohol was allowed in government owned ale houses. Government licenses for manufacturing alcoholic drinks came at a hefty price and had several regulations. While storing and serving

high quality alcohol became a status symbol for many high –income people; high prices of such drinks discouraged the low-income groups from buying them. Moreover, ban on local produce encouraged the growth of illicit alcohol produce which, due to the low price, became popular among most low-income communities. To end the oppressive British rule, several activists rallied against the alcohol industry and motivated Indian people to stay abstinent during the fight for Independence. The campaign against alcohol use was continued even during the post- Independence era (AD 1947 – current) and as a result, prohibition was added to the Constitution of India as a directive principle for all States (H. Sharma et al., 2010; Vaswani et al., 2009). However, in the latter half of the century, rapid economic growth, globalization, liberalization of regulations, poor regulatory policies combined with changing social attitudes led to tremendous increase in substance use rates in India, posing a serious threat to public health (Nayak et al., 2008).

Unfortunately, the threat of substance abuse remained unidentified until the 1970s. During the early 70s, new challenges emerged in the field of addiction due to the introduction of *heroin* in the illicit drug market of India. The problem was further complicated by increasing numbers of injecting drug users and the emergence of HIV infection in the country. This forced the Ministry of Health and Family Welfare, Government of India, to appoint an official committee in the year 1976 to investigate the problem and make future recommendations. Since then several studies have documented the prevalence and casual factors for substance use in India. Alcohol and tobacco were found to be the most commonly abused substances in India. A survey conducted during 1977-78 by Varma and colleagues (1980) among 1031 individuals (573 males and 458 females) from urban and rural areas in the State of Chandigarh, had found that nearly 16% of the sample had consumed alcohol at

least once in their lifetime (lifetime users) and 24% had consumed within the past 12 months (current users). Further examination of current users had revealed high proportions among males (41%), middle-age groups i.e., between ages 31 and 50 years (29%), married (24.7%), those living in rural areas (31.4% in Chandigarh & 45.9% in Jullundur), and highly educated groups (i.e. 13+ years of schooling; 24.7%). Nearly 2% of women were also reported as current users. Though the legal drinking age in the State of Chandigarh was 21 years, the majority users (78%) in this study had reported having their first drink before turning 21; 15% first drank between the ages 11 and 14 years.

Similar results were found in a recent nation-wide survey, NFHS-3, that examined the prevalence of substance use among124,385 women between ages 15 and 49 years, and 74,369 men between ages 15 and 54 years from 29 states of India. Alcohol and tobacco use was disproportionately high among men, middle-age groups (between 35 and 49 years) and rural population. Tobacco use was reported among more than half of the men (57%) and 11% female during the survey period. Similarly, a third of men (32%) and slightly over 2% females had consumed alcohol use during this period. Unlike the Varma et al. (Varma et al., 1980) study that reported high proportion among highly educated groups, alcohol and tobacco use in the NFHS-3 sample was significantly high among less educated, low income and lower castes (i.e., Scheduled caste or tribes) communities (International Institute for Population Sciences (IIPS) and Macro International, 2007).

Several studies have reported higher proportions of alcohol and tobacco use among rural and underserved population (Benegal, 2005; Gururaj et al., 2006; Ray, 2004). Girish et al. (Girish et al., 2010) conducted a household survey among randomly selected households (N=6,997) from four geographical settings (i.e., rural, slum, town and urban) around the city

of Bangalore, South India and found that, of the 46% "*alcohol using*" households (i.e., at least one person in the household reported alcohol use in the past 12 months), 61% were located either in the slum or rural areas versus only 11% were in the urban areas. Further evaluation of alcohol behavior of individual users revealed that those living in rural areas were engaged in heavy drinking (23%) and binge use (28%) more frequently than urban/town users. Typically, urban users consumed alcohol once a week, in commercial settings like restaurants and bars/pubs, along with friends, and were engaged mostly in infrequent heavy use (25%).

Heavy episodic drinking is the common drinking pattern reported by majority alcohol users in India, regardless of their location. In the "Bangalore study" conducted by (Gururaj et al., 2006) almost half of the current alcohol users (n=3705) were infrequent drinkers (15% drank 2-3 times/week and 33% drank 1-2 times/week). However, 41% of these current drinkers were engaged in binge drinking (consuming 4 or more drinks on a single occasion) and 32% did so monthly. The drinking habits of Indian users were also highly influenced by gender, age and the type of beverage consumed. Benegal (2005) conducted a survey among rural and urban areas of Karnataka, India (N=2979) as a part of the large multi-national study (GENACIS - Gender, Alcohol, and Culture: An International Study) designed by the International Research Group on Gender and Alcohol (IRGGA). Like most studies, prevalence of alcohol use was reported higher among men (33% vs. 6% females). Men (15.8%), in general, also reported frequent heavy drinking (i.e., 5 or more drinks consuming once a week or more). Specifically, middle-age men (21.8% vs. 1.9% women) were more likely to report frequent heavy drinking compared to younger and older groups. In addition, men drinking Indian Made Foreign Liquors (IMFL; Mean (SD) = 6.4 (3.3) drinks) and

arrack (Mean (SD) = 7.9 (4.3) drinks) and women drinking *arrack* (Mean (SD) = 5.8 (2.6) drinks) reported drinking heavily on a typical drinking occasion.

Regardless of their socio-economic status, majority drinkers in India preferred stronger drinks. Due to the high costs of IMFLs, however, drinks such as Whisky, Rum, Brandy, and Vodka were popular among upper-middle and high-income groups. On the contrary, a large proportion of drinkers from low income and lower castes consumed locally prepared drinks such as *arrack, toddy* (both prepared from the sap drawn from palm trees), *desi sharab,* and *daru* (prepared from high sugar content fruits such as orange, papaya, banana, and pineapple)*,* commonly called as "*country liquors*" (Saxena, 1999). Gururaj et al. (2006) found that nearly half of the alcohol users in their study preferred to drink whisky and another third (35%) preferred *arrack*. In addition, the All India Brewers Association (AIBA) has also reported a consistent yearly growth of 7-9% in the beer industry with the volume surpassing 155 million cases in the year 2008 (http://www.foodregulatorysummit.org/pdf/aiba.pdf).

Illegal alcohol use has become equally problematic in the past few years in India in addition to increased consumption, heavy and binge drinking of strong alcoholic beverages, and underage drinking. Due to increasing demand, high costs of legal alcohol and ban on local produces, illegal (or unrecorded) alcohol has become one of the fastest growing industries in India. According to the WHO, the average consumption of unrecorded alcohol (defined as "home-made or informally produced alcohol (or illegal), smuggled alcohol, alcohol intended for industrial or medical uses, and alcohol obtained through cross-border shopping;" (World Health Organization, 2014) in India was increased from 2 litres of pure alcohol in years 2003-04 to 2.2 litres in 2008-10. Between 2008 and 2010, half of the total

average adult per capita consumption (4.3 liters of pure alcohol) in India was attributed to

illegal alcohol. Moreover, almost a million people in India were engaged in the production

and sale of illegal alcohol (World Health Organization, 1999) which further complicated the

efforts of authorities to regulate this industry. Due to the low production costs and lack of

taxes, illegal alcoholic beverages were sold at a cheaper price and, hence, were popular

among economically deprived groups in India (Saxena, 1999; 2000). However, due to lack of

proper regulations, it was easy for the manufacturers to adulterate these drinks which often

led to severe disabilities and deaths due to poisoning ("*hooch*" deaths) in this population.

Factors Contributing Towards Problem Alcohol Use

A large literature has identified several genetic, psychosocial and environmental

factors linked with problematic alcohol use. In this section, I will discuss those factors that

have been found to impact alcohol use specifically among Indian drinkers. Some studies

suggests that changing individual and social attitudes towards drinking, dropping age of

initiation and exposure to stressful life events are responsible for increasing alcohol problems

in India (Benegal, 2005; Mattoo, Chakrabarti, & Anjaiah, 2009; Medhi, Hazarika, &

Mahanta, 2006). Others argue that consistent decline in the influence of religion and family

and social traditions have led to increased social sanctions for alcohol use in India resulting

in problematic use (Issac, 1998). Some macro-level factors such as exposure to foreign

cultures, repeated political changes, a rapidly growing economy, and liberalization of policies

have been linked with alcohol problems in India (Nimmagadda, 1999; Saxena, 1999).

Declining age of initiation (AOI)

The legal drinking age in India is 21 years. However, some studies have reported a

significant decline in age of alcohol initiation in the past few years. In a cross-sectional

survey conducted among 21,276 individuals, between ages 15 and 98 years, (Benegal,

Gururaj, & Murthy, 2003) found that the average age of alcohol initiation had dropped from 28 years (SD= 6.38) in the birth cohorts of 1920-1930 to 20 years (SD=2.44) in the birth cohorts of 1980-1990. Hazarika and colleagues (Hazarika, Biswas, Phukan, Hazarika, & Mahanta, 2000) also observed that, of the 312 men residing in a border town of Assam and Arunachal Pradesh (NE India), at least half of the sample had initiated drinking well before the age of 21 years.

Early initiation of alcohol use has been associated with severe AUDs and other problems in the later age. For instance, (Johnson, Banu, & Ashok, 2010) surveyed 200 male participants, between ages 20 and 50 years, admitted for AUDs (AUDIT scores 8 an above) in a large general hospital in Tamil Nadu, South India, and found that most participants had developed alcohol problems within five to seven years of initiating alcohol use. The average age at drinking onset in this population was 21.39 (SD= 5.34) and that for problem drinking and alcohol dependence were 24.28 (SD= 5.42) and 27.8 (SD= 5.7) years respectively. Results also showed a significant association between early alcohol initiation and severity of AUDs (F (3,196) = 6.15, $p<.001$), measured using the Severity of Alcohol Dependence Questionnaire (SADQ; (Stockwell, Murphy, & Hodgson, 1983).

Drinking attitudes and beliefs
Changing drinking attitudes have been found to be another potential risk factor for problem alcohol use in India. Recent studies have reported that, as the social stigma associated with drinking is gradually decreasing, people in India are developing more permissible attitudes towards alcohol use. For example, Arun, Chavan and Bhargava (2010) conducted a general population survey to examine the substance-related attitudes among 2992 men and women residing in rural and slum areas of Chandigarh, North India.

Standardized scales such as *Assessment of Attitudes toward Drinking and Alcoholism* (SAADA, (Basu, Malhotra, Varma, & Malhotra, 1998)) and *Assessment of Attitudes towards Drug Taking* (SAAD, (Basu et al., 1998) were utilized to measure individual attitudes towards substance use. Results revealed that, in general, there was high acceptance of alcohol use among the study participants. The majority of them had also expressed positive attitudes towards other drug use. On average, men alcohol users (M= 33.35; SD= 9.08) were more likely to show positive attitudes towards substance use than female users (M=18.09; SD= 14.01; *t*= 3.58, p<.001).

Nimmagadda (1999), however, observed that, though positive attitudes towards drinking were common among Indian people, the meanings attached to alcohol use varied with their socio-economic backgrounds. Results from the focus group interviews conducted among eight alcohol-dependent clients attending a treatment center in South India showed that drinking was a "status symbol" for several high-income and higher castes participants. One rich client mentioned that serving and storing alcohol at home or drinking expensive brands was a way of "*showing off*" and "*letting everyone know that they have made it.*" For high socio-economic clients, alcohol was a "dietary supplement," "appetizer," or something that helped them to "*enjoy a hearty dinner.*"

Drinking was often considered as a part of their "[bad] *karma*," or "*sanidhasai*" (i.e., a bad period of their life) by low-income and lower castes clients. This was reflected in following statements made by clients- "[through alcoholism] *they were punished for their bad deeds from previous lives*" and "*there is nothing I can do; it's because of my karma.*" Unlike the other group, poor clients often used alcohol as an effective "hunger suppressant." One client mentioned that "*I have worked all day. Am tired and hungry. I give 3 Indian*

Rupees [i.e. approximately 5 US Cents] *and get Pattai Sarayam* [illicitly brewed local liquor] *and I can forget my hunger. What can I eat in the meager 3 Rupees I have left? Sarayam is best.*"

Due to the non-experimental nature of the Nimmagadda (1999) study, it will be difficult to determine the association between personal attitudes and beliefs, and problem alcohol use in this population. However, the study highlights some key factors that needs to be considered while developing and implementing culturally-sensitive treatment programs for this at-risk and underserved population. Most important, the study emphasizes an urgent need for alcohol treatment programs that will address such misbeliefs and misconceptions, and create awareness about the negative consequences of drinking among this population.

Stressful life events (SLEs)

Several studies conducted among western populations have established an association between SLEs and physical and psychological conditions (Day et al., 1987; Dohrenwend & Dohrenwend, 1974; Kessler, 1997; Whitehead, Crowell, Robinson, Heller, & Schuster, 1992). A recent cross-sectional survey examining the biopsychosocial determinants of relapse among Indian adult substance users has also reported SLEs was one of the potential risk factors for relapse in this population (Mattoo et al., 2009). The study included 60 male clients, between ages 18 and 65 years receiving treatment at a de-addiction center in Chandigarh, North India for alcohol and Opioid dependence (ICD-10 DCR). Thirty relapse clients (n=30) were compared with abstinent participants (n=30) on their coping behaviors (Coping and Behavior Inventory or CBI), self-efficacy (Hindi translation of Self-efficacy scale or SES), experience of stressful life events (Presumptive Stressful Life Events scale or PSLES) and perceived social support (PSS). Results showed that, on average, relapsed

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clients reported significantly high scores for *negative thinking* (M=0.98, SD=0.39; *p*<.01)

and *undesirable life events* (M= 0.77, SD= 2.1; *p*<.05) than their counterparts. Relapsed

clients were also likely to score low on *positive coping behavior* (M= 0.79, SD= 0.34, *p*<.05).

Another study (Saini & Khan, 1997) examining the predictors of alcoholism and treatment

outcome among 300 male clients diagnosed with alcohol dependence also found that those

reporting higher stress ($\beta = 0.413$, p<.01) and negative self-beliefs ($\beta = .938$, p<.01) were

more likely to relapse during the 12-month follow-up.

Adverse childhood experiences/events (ACEs)

Negative consequences of early alcohol initiation, including problem alcohol use and

alcohol dependence at a later age, are often discussed in the literature (Grant & Dawson,

1997; Hawkins et al., 1997). Therefore, for prevention purposes, it is important to understand

the impact of personal and environmental factors on early onset of alcohol use. Numerous

studies have shown a significant association between problem alcohol use among adults and

childhood abuse, neglect, family violence, and/or family dysfunction, collectively termed as

ACEs (DeWit, MacDonald, & Offord, 1999; Douglas et al., 2010; Lo & Cheng, 2007; Strine

et al., 2012; White & Widom, 2008).

Child abuse

Anda and colleagues (2002) conducted a retrospective cohort study among 9,346

participants who had completed standard medical evaluation at the Kaiser Permanente's San

Diego Health Appraisal Clinic during the year 1995-96. The mean age of participants was

56.6 (SD= 15.6; range 19 to 94) years, 54% were women, 79% were White, and 42% were

college graduates. Data was collected using a structured questionnaire on variables such as

parental alcoholism, family dysfunction, and other ACEs, such as child abuse (verbal,

physical, or sexual abuse) having a battered mother, parental separation or divorce, and exposure in the household to drug abuse, mental illnesses, suicide or criminal behavior.

Results showed that the likelihood of experiencing any kind of childhood abuse, family violence and parental separation/divorce were significantly high among participants who had alcoholic parents. Similarly, the odds of experiencing illicit drug use by household members, mental illnesses among family members, and family history of crime or suicidal attempt were significantly high among those experiencing parental alcohol abuse in their childhood (p<. 001 for all associations). Furthermore, nearly 6% of the study sample were diagnosed with alcoholism at an early age. A strong association was reported between all the nine ACEs and alcoholism. It was found that participants experiencing ACEs were twice more likely to develop alcoholism in their adulthood compared to their counterparts. The study also reported a dose-response relationship between ACEs and alcohol abuse. The risk of developing alcohol abuse in adulthood increased gradually with the number of ACEs experienced and was reported highest among those experiencing four or more ACEs (OR= 5.5, 95% CI: 4.1 – 7.3) in their childhood (Anda et al., 2002).

Childhood Abuse, especially sexual abuse (CSA), is a serious social problem in India. However, barriers such as lack of communication between children and parents regarding sex, lack of awareness among children about the possibility of abuse and stigma associated with open discussion of sex-related issues in India often inhibits the timely reporting of such cases. This could be one of the reasons that, despite the high proportion of CSA cases in India (http://www.childlineindia.org.in/Background-to-CSA.htm), studies examining its psychosocial impacts are rare in this population. Though CSA was not the primary outcome of interest in a population-based survey (N=2,979) conducted by Benegal (2005), results

from this study showed that it was common among adult problem alcohol users to report

CSA. At least 15% of women and 10% men in this study had experienced some kind of CSA.

The study also showed that CSA had greater impact on female respondents than men. The

proportion of CSA was significantly high among female alcohol users (20.5%) than

abstainers (11.3%; $\chi^2 =5.7$, $p<0.05$).

Family history of alcoholism

Studies have shown that the risk of alcohol/drug abuse is high among those having a

family history of substance use. For instance, Chopra et al. (2008) conducted a general

population survey in Thrissur district of Kerala, India to examine the relation between

parental alcoholism and adolescent alcohol use. The study compared father-son dyads having

drinking fathers (n=1979) with non-drinking fathers (n= 4885). Results showed a significant

association between parental and adolescent alcohol use ($\chi^2=107.1$, df= 1, p<.0001). Those

having alcoholic fathers were three times more likely to engage in alcohol/drug use

compared to their counterparts (10% vs. 3.7%; OR= 2.9, 95% CI: 2.3 – 3.6).

Similar findings were reported by Atilola and colleagues (2014) in a cross-sectional

survey conducted among 2454 adolescents (included n=398 participants from India) from

seven developing nations (India, Indonesia, Nigeria, Serbia, Turkey, Bulgaria and Croatia).

Participants were selected randomly from schools located within the vicinity of the

researchers' location. Substance abuse was assessed using the CRAFFT questionnaire

(Knight et al., 1999). Mean age of the total sample was 15.6 (SD=1.3) years and that of

Indian sample was14.5 (SD= 0.68) years. Nearly 41% of the total sample (8% of Indian

sample) had reported using alcohol and/or drugs in the past 12 months, 45% of which were

qualified as problematic substance users (3% among Indian users) based on their CRAFFT

score. Single parenting (β= .34; p<0.05), fewer siblings (β= -0.07; p<0.05), lower maternal education (β= -0.73; p<0.001), maternal unemployment (β= -0.33; p<0.01), and parental substance use (β= 1.24; p<0.05) were found to be the significant indicators of substance use in this population.

Parental divorce (PD)

Though studies on parental divorce are rare in India, those conducted among western populations have determined PD as a significant risk factor for adolescent or adult substance use. For instance, Pilowsky et al. (2013) conducted secondary analyses of the 2001-2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) data (N=43,093) and found that experiencing parental alcohol problems and divorce before the age of 18 years significantly increased the risk of lifetime alcohol dependence (based on DSM- IV criteria) among the US adults. Further analyses of individual ACEs (i.e., parental divorce, death of a biological parent, living with foster parents, and living in an institution outside the home) revealed that those experiencing parental divorce were twice more likely (OR= 1.81, 95% CI: 1.65 – 1.19) to report alcohol dependence compared to their counterparts. Similarly, the odds of reporting alcohol dependence were three times higher (OR= 3.25, 95% CI: 2.99 – 3.53) among those experiencing family alcohol problems versus those having no history of family use. This study also showed a dose-response relationship between the number of ACEs experienced (a total count was created by summing the ACEs) and alcohol dependence. After controlling for covariates and potential confounders (such as early onset of drinking, binge drinking and family alcoholism), a significant association was found between two or more ACEs and alcohol dependence.

Family dysfunction

Dysfunctional family structures/broken homes were another factor associated with early onset of alcohol use. Sharma and colleagues (2015) conducted face-to-face interviews among Juveniles (N= 487), between ages 8 and 18, kept under observation in a male short stay home operated by a non-profit organization (NGO) in New Delhi, North India. Data were collected by trained social workers using a semi-structured questionnaire. The average age of participants was 14.17 years and most of them came from lower socio-economic households (92%). Results showed that those coming from dysfunctional families were at higher risk of getting involved in alcohol use at an early age. Family dysfunction, in the form of broken family structures (p<0.001) and criminal history in families (p<0.01), was also associated with drug misuse among this population.

In general, studies examining the association between ACEs and adult alcohol use are rare in India. Few studies that examined ACEs and substance abuse have focused on child abuse, family alcoholism and family dysfunction/broken family structures. However, effects of parental separation, single parenting, or physical and mental illnesses in the family during childhood are seldom been studied. In India, the rates for divorce/separation have been low for the past several years, 0.1% and 0.3% respectively according to the 2011 Census data (http://www.censusindia.gov.in/2011census/C-series/c-2.html). However, this is changing rapidly. Some researchers believe that, in the past, the traditional joint family structures, social and family pressure associated with "arrange marriages" (those fixed by parents and relatives) and social stigma have played a crucial role in preventing Indian marriages from falling apart. Also, the stable, secure, close and resilient traditional joint family structures, which included three to four generations (i.e., grandparents, parents, uncles, aunts, nieces and

nephews) living together under the same roof, have provided physical, mental and emotional support to its members and kept them united in stressful situations (Chadda & Deb, 2013).

Recent studies, however, have shown that the rapid economic, political, and social changes in India are giving way to more nuclear family structures Chadda et al. (2013). This has also changed the meanings attached to marriages. They are no longer perceived as "divine match" or "sacred union." The social pressure and stigma associated with divorce/separation are also decreasing gradually among Indian people. Though the proportions are still low than most developed nation, there is a general agreement among Indian scholars that the divorce rates are increasing rapidly (Amato, 1994). Therefore, it has become essential to consider the impact of these changes on the physical and psychosocial development of adolescents and young adults as well as their involvement in risky behaviors in adulthood.

In addition to the above-mentioned individual and environmental factors, studies have identified certain demographic characteristics, such as poverty, castes and geographical settings, as potential risk factors for the increasing substance abuse problems among Indian people.

Poverty

Studies have consistently showed higher rates of alcohol and drug abuse among low socio-economic groups. According to the NFHS-3, 41% men and 6% women reporting substance abuse belonged to the lowest quartile of wealth index (International Institute for Population Sciences (IIPS) and Macro International, 2007). Poverty has been linked with several health and social consequences in India. Currently, the economic status of individuals in India is measured based on the per capita minimum expenditure required for survival.

Based on this measure, the survey conducted by the Planning Commission of the Govt. of India during 2011-12 found that, on average, 22% of the total surveyed population fell under the poverty line (25.7% in rural and 13.7% in urban areas; (Government of India, 2013). Thus, in the given year, nearly one-fourth of India's population was found to be deprived of necessities of life such as safe drinking water, sanitation, housing, health infrastructure and adequate nutrition.

Studies have found a strong association between poverty and substance abuse. For instance, Neufeld and colleagues (2005) analyzed the data from the 52nd National Sample Survey (NSS) conducted in India during the year 1995-96. The study estimated national prevalence of alcohol and tobacco use and examine its association with age, gender and poverty. The sample included 471,143 individuals over the age of 10 years from 35 states and 7 union territories in India. Neufeld et al. found that the prevalence of alcohol use was higher among those who fell under the poverty threshold (6%) compared to those who were above this threshold (4%). The prevalence of reporting regular alcohol use was found to increase with the decrease of income levels in this population and the odds of alcohol use were 1.5 times higher (95% CI: 1.4 – 1.7) among participants from lower income households.

Castes

The caste system, originally designed by Aryans, has become an integral part of an individual's identity in India. Indian caste, defined in the literature as "a hierarchy of endogamous groups that individuals enter only by birth" (Olcott, 1994), is divided in following four classes from top to bottom – 1) *Brahmins* includes priests and those performing religious activities, 2) *Kshtriyas* includes the warriors and royal families, 3) *Vaishayas* are those involved in trading and businesses, and 4) *Shudras*/*Dalits* includes

"Scheduled" castes, the aboriginal tribes and people from other "backward" castes. A person's castes govern every aspect of his/her life, from food, occupation, friend circles to rituals, ceremonies and festivals. Since the *Vedic* eras, *Kshtriyas* and *Vaishayas* were the only two castes permitted to consume mild/moderate amount of alcohol on special occasions. Hindu religion prohibited *Brahmins,* women and youths from engaging in alcohol use any time.

In earlier eras, *Shudras*/*Dalits* were never considered a part of main stream society. They were restricted from attending schools or participating in social activities with others. Hence, for several years these communities have remained less educated, poor and socially marginalized. Unlike the other castes, they had no restrictions on substance use and usually relied on locally produced stronger forms of alcohol such as distilled spirits prepared from rice, palm, sugarcane and grains, also known as "country liquors." Some groups also offered alcohol and meat to Gods as a part of tribal rituals (Mahdihassan, 1984; H. Sharma et al., 2010; Vaswani et al., 2009). Later, the ban on local brews during the British era gave rise to illegal alcohol industries which further increased the risk of problem use in these communities.

Alcohol use has always been a huge problem among lower castes. The NFHS-3 had reported alcohol use among half of the men and 14% women belonging to "scheduled" castes and tribes (International Institute for Population Sciences (IIPS) and Macro International, 2007). In addition, through the focus group interviews conducted among lower castes and marginalized people (known as "*Paniyas*") living in five different communities in Kerala, India, Mohindra and colleagues (2011) had found that many *Paniya* men were involved in alcohol use from young age. Since most *Paniya* households lived on daily wages, the

drinking frequency of alcohol users varied per their daily earnings. However, most men reported drinking daily or at least four times a week. Alcohol was easily accessible in these communities. Majority drinkers purchased their alcohol from government run outlets known as "Kerala State Beverages Corporation (KSBC)." Though participants hesitated to report illicit alcohol use, it was readily available in these communities. Mohindra et al. also found that employers often took advantage of poverty and illiteracy among *Paniyas* and used alcohol to lure men for work, later deducting those expenses from their daily wages. Alcohol problems increased the burden of *Paniyas* who were already suffering from high levels of poverty, discrimination and inadequate health care access.

Geographical settings

Studies have shown that rural and underserved population in India are prone to severe alcohol problem mainly due to limited resources and treatment services in these areas. According to the NFHS-3, the proportion of alcohol users was high among rural (32.5% men and 3.0% women) areas compared to urban settings (30.9% men and 0.6% women; (International Institute for Population Sciences (IIPS) and Macro International, 2007). Through a household survey conducted in Southern India, Gururaj et al. (2006) had found that frequent heavy use and binge drinking was common among rural users. Binge drinking usually occurred around pay-days, marriages, festivals and parliamentary elections due to easy availability. Many rural users preferred "country liquors" such as "*arrack"* and *"toddy*" (50.3%) which were cheap and easy to adulterate due to lack of manufacturing standards; and proportion of illicit alcohol users was also high among rural population (0.9%).

Alcohol use also varied by different regions in India. Among men, the prevalence of current alcohol use ranged between 16% in Gujarat (W India) and 61% in Arunachal Pradesh

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(NE India). A large proportion of men in Manipur (47%) and Mizoram (42%) reported

drinking despite the official state-wide prohibition in these regions. Similarly, among

women, prevalence of current alcohol use ranged from as low as 0% in Jammu and Kashmir

(N. India) to 33.6% in Arunachal Pradesh. Proportions of women drinkers were especially

high among NE (19% Sikkim), Central (11% Chhattisgarh), and Eastern states of India (10%

Jharkhand & 7.3% Orissa; (International Institute for Population Sciences (IIPS) and Macro

International, 2007). It is essential to consider such regional and cultural variations when

developing alcohol policies and treatment programs.

Involvement in leisure time activities

Due to limited data, it is difficult to determine the exact role of leisure time activities

in problem alcohol use. However, one study conducted among youths in India have found a

significant association between leisure time activities and alcohol use. Singh and colleagues

(2010) conducted a cross-sectional survey among young adults (ages 18 to 29 years),

migrated from southern (Andhra Pradesh) and northern (Uttar Pradesh) parts of India in the

search of work and residing in low income communities of Mumbai. The sample (N=1239)

included men working as loaders, distance drivers, and factory workers. Results showed that

86% of the sample were current drinkers (i.e., consumed alcohol within the past 30 days of

the survey). Majority current drinkers were less educated (18% had completed high school

and 35% had less than primary school education), married (60%) and almost a third of them

lived without their wives. The mean age of initiation for alcohol use was 19 years (range 12

to 26 years).

Problem alcohol use was diagnosed based on the AUDIT scores. Participants were

further categorized into: a) *low-level drinkers:* those who drank less than once a month, b)

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moderate-level drinkers: who drank more than three drinks at least two to four times a month, and c) *high-level drinkers:* for those who drank more than three drinks at least two to three times a week. Results showed that nearly 20% of the sample were either moderate- or high-level drinkers. The odds of engaging in high-level drinking increased significantly with age (OR for 21 to 34 age group= 1.8 and OR for 25+ age group= 2.8; *p*<0.05), childhood exposure to alcohol (OR for moderate exposure= 1.9, OR for high exposure= 3.8; *p*<0.001) and involvement in leisure activities such as roaming with friends, playing cards, gambling, seeking women, etc. (OR= 2.1 for 1 or 2 activities, OR= 3.9 for 3+ activities; *p*<0.001; (Singh et al., 2010).

Protective factors

Majority alcohol studies in India have focused on various risks factors. Despite the inclusion of family members and religious components in alcohol treatment programs in India, their role in preventing problem alcohol use is rarely been studied.

Family support

Studies have established the association between family risk factors, such as family history of alcohol use, violence and dysfunctional families, and problem use. However, while conducting de-addiction camps in the rural and underserved areas of India, Cherian (1989) observed that family members could prove as valuable assets during the recovery process, especially in those areas were resources were limited. Cherian noticed that several clients were accompanied by at least one family member who showed interest in the treatment process and were also ready to help in every possible way. Furthermore, support from family members often motivated clients to stay compliant and achieve their treatment goals. As a result, in 1996 a family component (i.e., family participation and support groups for family members) was added to camp treatments conducted by the T.T. Ranganathan center.

Like most alcohol studies in India, data on family support is limited. However, two studies have demonstrated that involving family members during the treatment process result in better outcomes among alcohol users (Nattala, Leung, Nagarajaiah, & Murthy, 2010; Suresh Kumar & Thomas, 2007). Nattala et al. (2010) conducted a randomized controlled trial (RCT) among alcohol dependent (based on ICD-10 criteria) patients admitted at the de-addiction center located in a tertiary hospital in Bangalore, India. The sample included all male clients (N=90) between ages 20 and 60 years. The study required that: (a) at least one family member between ages 20 and 60 who has been living with the participant for at least 3 months before the study and continues living with them should accompany the participant, (b) the participants should be able to converse, read & write in regional language or English, and (c) the participants were recommended inpatient treatment by the treating physician.

After enrollment, each participant was randomly assigned to one of the following three groups: 1) *individual relapse prevention* (IRP) which included eight to ten interactive sessions of one hour each that involved practice exercises to identify drinking triggers, formulate plan to confront those triggers and develop coping skills for different problems, 2) *dyadic relapse prevention* (DRP) which included active participation from at least one family member along with the participant in the IRP activities. In addition, the dyads also participated in role playing activities such as practicing refusal strategies, planning monthly budget, making daily time schedules and revising the problem-solving techniques. Separate sessions were conducted for family members in this group that covered important guidelines for supporting abstinence and provided a platform for families to talk about their difficulties, life circumstances and discuss a plan of action that would benefit the recovering addicts, and 3) *treatment as usual* (TAU) which included a pharmacotherapy for detoxification and long-

term withdrawal symptoms and a simple advice to quit drinking and make positive changes. Follow-ups were conducted monthly till the end of 6-months.

The average age of participants at baseline was 39 (SD=8.0) years, 86% were married and 62% belonged to low socioeconomic groups. Three-fourth of the sample were diagnosed with alcohol dependence syndrome and nearly 73% had positive family history of alcoholism. Preliminary findings of the study showed marked reduction in number of drinking days and alcohol problems across all groups at the end of 6-months. However, the *post-hoc* comparison revealed a significant difference between DRP and TAU ($p<0.05$) as well as IRP ($p<0.05$) participants for all outcomes. DRP participants stayed abstinent for a longer duration as compared to IRP and TAU participants. The mean difference in the number of drinking days from baseline to 6-months among DRP participants was 22.33 (SD= 13.05) days versus 10.9 (SD= 14.58) days for IRP and 8.99 (SD= 13.96) for TAU participants. Additionally, the study showed higher compliance rates during follow-ups visits among DRP participants (83% attended all six follow-up visits) compared to IRP (43%) and TAU (24%) participants ($\chi^2(2) = 22.4$; $p<0.001$). Nattala et al. also observed that involving family members during the treatment process had helped the couples to amend their relationships and have positive impact on their lifestyle.

Religiosity

Though religiosity is a multi-dimensional phenomenon (Koenig, McCullough, & Larson, 2001), some of its dimensions, such as religious affiliations, traditional and religious rituals, etc., are studied more frequently than others and are found to have significant impact on alcohol problems (Bartkowski & Xu, 2007; Ellison, Bradshaw, Rote, Storch, & Trevino, 2008; Epler, Sher, & Piasecki, 2009). Chitwood and colleagues (2008) conducted a systematic review of peer-reviewed articles published on religiosity/spirituality and alcohol

or drug use between 1997 and 2006. The 105 published articles were identified from several countries including United States, United Kingdom, Canada, Brazil, Thailand, Korea, Finland, Hungary, Iceland, Israel, Netherlands, South Africa, and Latin American/Caribbean countries. Studies were compared on six methodological aspects including sample size, study group, region, design, dimensions of religiosity investigated, and psychoactive substances studied. Majority studies (55%) investigated substance use among adolescents recruited primarily from school settings, followed by college students (20%) and adults in general (16.2%). Few studies (3%) were conducted among 65 and older population.

Though the conceptualization and measurements of religiosity varied across studies, Chitwood et al. (2008) were able to categorize the measures of religiosity in following main dimensions- a) *organizational religiosity* that included participation in formal religious practices, rituals and regular attendance at religious services, b) *religious affiliation* which referred to identification with religious groups, c) *subjective religiosity* involved self-evaluation of individual religiousness. Questions that were usually asked in this category included "how religious the respondent considers themselves to be?" or "how important religion is in their lives?" d) *religious belief* included questions such as "do you believe in God?" or "do you believe in life after death?" e) *non-organizational religiosity* included religious activities that could be performed in isolation and did not necessarily required any affiliation with religious organization, for instance praying, reading scriptures, and listening to religious programs on radio or television, and f) *religious coping* referred to various religious-based activities that people rely on during stressful or difficult life circumstances. Majority studies had included organizational (52%) or multidimensional (one or more

dimensions; 31%) religiosity in their investigation. Studies investigating the effect of religious coping were scarce (2%).

Most studies examined the impact of religiosity on alcohol (81%) and marijuana (36%) problems. Data on other substances such as cocaine/crack (13%), opiates (5%) and other illicit drugs was very limited (8%). It was presumed that lack of data on other illicit drugs could be since most studies were conducted among adolescents and younger participants from general population who typically are in experimentation stage of drug use. Findings from the reviewed studies suggested that (99 out of 105 studies) religiosity, regardless of specific dimensions, was significantly associated with reduced risk of alcohol/marijuana use. Seventy-three (out of 85) alcohol studies, and 31 (out of 37) marijuana studies reported religiosity as a protective factor against use or misuse. Further analyses of specific dimensions of religiosity revealed that *organizational religiosity* was the most frequently studied dimension which also had significant positive impact on substance use (Chitwood et al., 2008).

The relation between alcohol use and religion in India can be dated back to *Vedic* era. Though India was known as the "country of abstinent," due to low prevalence compared to other countries, alcohol culture in India has always been very ambivalent. Hindu religion (practiced by almost 80% of the population in India) had restricted *Brahmins*, students and women from consuming alcohol, at the same time, had allowed mild/moderate use among *Kshatriyas*, *Vaishyas*. Similarly, *Quran*, a holy Bible for Muslims, considered alcohol as one of the seven sins and restricted the Muslims followers from consuming it. However, several historical evidences have shown an active involvement of Muslim rulers in substance use (H. Sharma et al., 2010).

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Recent studies conducted among Indian population have shown a strong association between religiosity and alcohol use. Sukhwal and Suman (2013) conducted a cross-sectional survey among undergraduate students (N= 236) between ages 18 and 21 years residing in Bangalore, India to examine the influence of religiosity on alcohol-related beliefs among this population. Alcohol related attitudes and expectancies (Alcohol-Expectancy Questionnaire or AEQ, (Brown, Goldman, Inn, & Anderson, 1980), positive and negative effects of alcohol on this population (Positive and Negative Affect Schedule or PANAS; (Watson, Clark, & Tellegen, 1988), personal beliefs and values (Beliefs and Values Scale or BVS; (King et al., 2006), and religious inclination (Religious Background and Behavior Questionnaire or RBBQ; (Connors, Tonigan, & Miller, 1996) were assessed using standardized scales. There were no baseline differences by gender on any variables. A negative association between alcohol attitudes and religiosity suggested that students with less *God consciousness* ($r = -0.16$, $p<0.01$) and involvement in *formal practices* ($r = -0.16$, $p<0.01$) developed more positive attitudes towards alcohol. On the other hand, a positive correlation between religiosity and positive affects indicated that *God consciousness* ($r =0.18$, $p<0.01$) and involvement in *formal practices* ($r = 0.17$, $p<0.01$) had greater positive impact on individual's life.

The study also showed that religiosity had stronger impact on female participants than men. Female students who reported family history of alcohol use (M= 17.66, SD= 4.52; t= 2.03; $p< 0.05$) and prior substance use had scored significantly low on *God consciousness* component (Mean= 16.55, SD= 5.12; t= 3.96; $p< 0.05$) compared to their counterparts (Sukhwal & Suman, 2013). Thus, though the religious beliefs and affiliations that prevented alcohol misuse in India for the past several years are weakening rapidly (Issac, 1998),

including them during the alcohol treatment process might help in improving the outcome in this population.

Negative consequences of problem alcohol use
Individual consequences
Alcohol Use Disorders (AUDs)

Studies have shown that increased consumption, and frequent heavy drinking, and early age of initiation predict AUDs among Indians (Silva, Gaunekar, Patel, Kukalekar, & Fernandes, 2003). In a community-based survey of 2992 men and women from rural and urban areas of Chandigarh, North India, Chavan , Singh, Arun, & Bhargava (2007) found that at least 7% of the study population qualified as alcohol dependent based on the ICD-10 criteria (World Health Organization, 2010). Similar findings were reported by D'Costa and colleagues (2007) during a survey conducted among 1567 patients attending 10 different general practice facilities in Goa, India. Of the 630 current alcohol users, 20% were found to score 8 and above on the AUDIT, thus, qualifying as dependent users.

Further examination of the chronology of dependence symptoms among Indian alcohol users showed that, on average, Indian users develop alcohol dependence within 6-8 years of onset of alcohol use (Manjunatha, Saddichha, Sinha, Khess, & Isaac, 2008). Data were collected through a cross-sectional survey conducted among 81 AUD patients (ICD-10 criteria) admitted at the Center for Addiction Psychiatry (CAP), Central Institute of Psychiatry (CIP), Ranchi, India. Survey results showed that the average age of alcohol initiation in this sample was 18.72 years (SD 6.84), for the occurrence of 1st dependence symptom was 24.33 years (SD 9.21), and for the diagnosis of ICD-10 dependence was 27.51 years (SD 9.28). Tolerance (98%), loss of control (80.24%) and craving (79%) were the commonly exhibited symptoms by most alcohol dependents.

HIV/AIDS

Recent studies have also associated problem alcohol use with the spread of HIV/AIDS infections in India. Per the 2013 United Nations Global Report on AIDS, India had the highest number of people living with HIV infection (2,100,000) in the entire South-East Asia region. Moreover, India accounted for almost 64% of all the AIDS-related deaths (220,000) in this region during the year 2012 (UNAIDS, 2013). Alcohol was determined as a key risk factor for the spread of HIV and sexually transmitted infections (STIs) in India in a recent review conducted by Schensul and colleagues (2010). The study showed that those consuming alcohols prior to the sexual activity were more likely to engage in risky behaviors such as unprotected or anal sex thereby increasing the risk of spreading HIV and STIs.

Other health-related problems

In addition to early AUDs, alcohol users also report several physical and psychological illnesses including abdominal pain suggestive of gastric ulcers, generalized weakness, memory loss, cough, difficulty breathing, poor sexual performance, obstructive/chronic lung diseases, pneumonia, malignancy (esophagus, liver), tuberculosis, pancreatitis, epilepsy, hypertension, cardiomyopathy, nutritional deficiency, irritability, anxiety, depression, delirium, tremens, and other somatic problems like headache and generalized aches and pains (Benegal et al., 2003; Srinivasan & Augustine, 2000).

Legal and work-related consequences

A large proportion of alcohol users in India also face other problems, including legal, and work-related consequences, due to their drinking habits. Legal problems always arise from small fights following intoxication, stealing and homicide (Gururaj et al., 2006; Gururaj, Murthy, Girish, & Benegal, 2011). Most users lose their jobs due to absenteeism, lack of punctuality, deteriorating work efficiency, accidents while working with heavy machines, disabilities and tensed employer-employee relations (Gururaj et al., 2006).

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Additionally, "hooch deaths" are common among those consuming illicit alcohol. Thousands of deaths and disability incidences associated with illicit alcohol consumption have been reported in media and newspapers from different regions in the past few years (http://www.hindustantimes.com/india-news/timeline-major-hooch-tragedies-in-india/article1-782819.aspx).

Social consequences
Intentional and unintentional injuries
        This includes road traffic accidents, high crime rates, rapes, suicidal ideation/attempts, and domestic violence (Gururaj, 2002; Gururaj et al., 2006; Mishra, Banerji, & Mohan, 1984; Mohan & Bawa, 1985). In the "Bangalore study" Gururaj et al. (2006) found that the odds of reporting physical injuries due to violence, hitting, shoving, and abuse were significantly high among alcohol users (OR= 5.1; 95% CI: 3.9 – 6.8) compared to non-users. A higher proportion of drinkers also reported suicidal ideation (OR=1.8, 95% CI: 1.6–2.1) and suicidal attempts (OR= 4.6, 95% CI: 1.3 – 16.3) compared to non-drinkers in this study. While investigating the police records of 2652 completed suicide cases in the city of Bangalore, Gururaj and Benegal (2002) also found that 15% men and 1.5% women who committed suicide were the victim of chronic alcohol use. Furthermore, the records revealed that more than half of the sample (56%) were under the influence of alcohol at the time of suicide.

Domestic violence
        One of the frequently occurring but inadequately recognized social problem caused due to alcohol use in India is domestic violence. Due to the strong linkage between alcohol use and domestic violence, alcohol is considered as one of the most significant issues for women in India. A multi-disciplinary faculty of the Indian Clinical Epidemiology Network (India-CLEN) conducted a large population-based multi-centric collaborative project called

the "Study of Abuse in the Family Environment in India" (IndiaSAFE). The study involved a cross-sectional household survey among women (N= 9938), ages 15–49 years, living in rural, urban and urban-slum areas in the seven different cities (New Delhi, Lucknow, Bhopal, Nagpur, Chennai, Trivandrum and Vellore) of India (Jeyaseelan et al., 2007). Results showed that 26% of women had experienced physical violence during their lifetime of marriage. The proportion of physical violence, single or multiple, was high among women living in rural and urban-slum areas compared to those living in non-slum urban areas. Alcohol use was significantly associated with most physical violence cases. Women reporting spousal drinking (38%) were at greater risk of experiencing physical violence than their counterparts (OR=7·3, 95% CI: 6·4–8·3; (Jeyaseelan et al., 2007).

Family consequences

Problematic alcohol use has as much negative impact on families as the users themselves. While alcohol users frequently report unsettling interpersonal relationships with family members due to their drunken behavior, family members, on the other hand, often complain about feeling guilty, angry, ashamed, sad, and isolated from the society due to problem alcohol users in their family (Gururaj et al., 2006). Furthermore, women in this study mentioned that confronting with alcoholic partners about their drinking habits often led to harassments, conflicts or tense atmosphere between couples resulting into divorce, separation or development of co-dependence (i.e. "a condition where the spouses develop an unhealthy pattern of coping with life and unconsciously maintain the abuser's condition despite being troubled at a conscious level", (Gururaj et al., 2006).

Another study conducted among 113 male alcohol dependents (based on ICD-10 criteria) participants admitted at the psychiatric treatment center showed that problem alcohol use had incurred tremendous financial burden on the already poor families, disrupting the

family structure (Benegal et al., 2000). Results showed that, despite their low income (Mean income= 1661 INR/ 33 USD per month), most participants had spent more than 70% of their income in buying alcohol, contributing significantly less to the monthly expenses of the family. Most participants (94%) were admitted multiple times to the hospital within the past two years of the study. Frequent hospitalization had forced at least 15% of them to lose their jobs or accept lower paying jobs adding to the financial burden. Such situations had often forced one or more children below the ages of 15 years from at least 10% of the households to drop out from school and find jobs so support their families.

Alcohol Treatment Services in India

Since alcohol is considered as a multi-phasic condition by most alcohol researchers and clinicians in India, treatments available for alcohol problems are based on Engel's biopsychosocial model (Engel, 1978). Accordingly, most alcohol treatment packages in India included three components: (a) a *biomedical* component which included pharmacological treatments such as detoxification, and symptomatic relief for cravings and withdrawal symptoms, (b) a *psychological* component which combined the cognitive-behavioral therapies, motivational interventions, psycho-education and family therapies, and (c) a *socio-cultural* component which included community participation & reinforcement, vocational rehabilitation and some culture-specific element (Murthy & Bala Shanthi Nikketha, 2007).

Though alcohol treatments in India are based on a holistic approach, number of facilities providing such treatments are very limited. At present, alcohol treatments are available mainly through the government operated treatment centers. To address the growing need, during the 1980s, the Government of India developed a three-tier "De-addiction Program" under the supervision of Ministry of Health and Family Welfare. This program is implemented nation-wide through a National Drug-Dependence Treatment Center

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established at the All India Institute of Medical Sciences (AIIMS), New Delhi and four

regional centers each in Chandigarh, Ranchi, Bombay and Bangalore. These centers provide

alcohol treatments at three different levels: (a) *center-based care-* alcohol treatment and other

required services are provided at the main center; (b) *community-based care-* district level

care is provided through civil/district hospitals and medical institutions in nearby cities; and

(c) *outreach services*, also known as primary health centers (PHCs), provide basic medical

services in rural areas. Some private psychiatric clinics, hospitals and non-profit

organizations also provide alcohol treatments to some extent. However, the proportion of

these clinics is very small (Lal & Ambekar, 2009).

Except the PHCs, most alcohol treatment facilities in India are located in (or near) big

cities. Therefore, despite the growing efforts, fewer alcohol users especially those living in

rural and underserved areas receive adequate treatment. Arun et al. (2004) conducted a

survey in the rural area of North India to compare the treatment seeking behavior of alcohol

users attending a community clinic (n=48) with the non-treatment seeking clients (n=100)

residing in the same community. The sample were all men, ages 15 and above. Some of the

reasons for seeking treatment included- a) participant's own wish to recover, b) physical

problems such as withdrawal symptoms, c) fear for physical illnesses, d) social pressure such

as family responsibilities, and e) social rejection. A large proportion of treatment seekers also

reported that they were aware of treatment availability and effectiveness of alcohol

treatments. In contrast, the primary reasons for not-seeking treatment included- a) perceived

short-term psychological (for ex: helps to forget worries, problems and anxieties) or physical

benefits of substance use (for ex: decreases tiredness and keeps physically fit), b) lack of

financial resources to pay for hospitalization and travel, c) time constraints, d) lack of

awareness about treatment availability or effectiveness, e) social stigma associated with

seeking treatment in a psychiatric ward, f) lack of family support, and g) fear for withdrawal

symptoms.

Treatment camps

        To address these barriers, the Indian Government along with some non-profit

organizations started offering community-based treatments through mobilized clinics, known

as "treatment camps," in rural and underserved areas (Lal & Ambekar, 2009). Health issues

such as immunization, family planning, heart diseases, diabetes, etc., have been successfully

treated in the past through camps settings in rural areas. Thus, the rural population was

familiar with the concept of "treatment camps" (Ranganathan, 1994). This could be one of

the reasons that de-addiction camps are well received in several parts of India. The primary

goal of these camps is to identify problematic alcohol users from communities and convince

them for treatment. Treatment is provided at no cost and is tailored towards individual needs

of the client. Besides providing detoxification treatment, the camps focus on creating

awareness about alcohol problems and reducing the social stigma associated with drinking;

thereby encouraging people to seek help for their alcohol problems (Ranganathan, 1994). In

addition, by involving family and community members, the camps attempt to increase social

support, and facilitate social integration of recovering addicts (Cherian, 1989).

Brief Overview of Treatment Camps

        The T.T. Ranganathan Clinical Research Foundation and treatment center (i.e., TTK

center) is a voluntary welfare organization established in 1980 by Dr. Shanthi Ranganathan.

TTK center has been serving problem alcohol users in rural areas of India for more than two

decades. The first de-addiction camp was conducted in *Manjakuddi* village of Tamil Nadu,

South India in 1989. Since then the center has been providing free alcohol treatment for

several low-income clients from the surrounding areas. Complete abstinence and improved lifestyle are the primary "*treatment goals*" of these camps. In addition, the camp staff work together with community and family members to- a) create awareness about alcohol problems; b) reduce the social stigma associated with drinking; thereby encouraging people to seek help for their alcohol problems; and c) increase social support and facilitate social integration of recovering addicts (Ranganathan, 1994).

The camp treatment is based on the following principles of Minnesota model (Anderson, McGovern, & DuPont, 1999; C. C. Cook, 1988): a) "*possibility of change*" which states that alcohol users can change their attitudes and behaviors, and b) "*disease concept*" which considers alcoholism as a "multiphasic" illness influenced by physical, psychological, social and spiritual factors. The key elements of camp treatment are: 1) integrating professional care with trained recovering alcoholics; 2) provide continuous and sustained after care; 3) maximizing the involvement of families during the recovery process and educating both families and clients about the ill-effects of alcoholism; and d) emphasizing the importance of "*Alcoholics Anonymous (AA)*" concepts like "powerlessness," "compliance," "unmanageability" and "prayers" to help the clients accept their past and make positive lifestyle changes (Cherian, 1989). Each camp cohort consists of 20-30 patients and includes the activities listed below.

Pre-camp activities

These recruitment activities mainly involve identifying problem alcohol users from the community, and convincing them to seek treatment. Communities, also known as "host organizations," play an important role during this preparatory phase. Alcohol users are identified with the help of social workers, community leaders, local physicians and/or family members. The community also provides basic infrastructure support such as, food,

accommodation and other resources required to conduct the camps. In addition, community members work together with the treatment staff to build a safe and supportive environment for camp participants.

Camp activities

The camp staff consists of one psychiatrist, one residential doctor, 5 clinical psychologists, 5 social workers, one recovering alcoholic and one administrative staff. The total duration of the camp treatment is 15 days. It is an in-patient treatment program that includes: a) three days of detoxification, and b) 12 days of psychosocial therapies. During the detoxification phase, each patient is treated with the appropriate dose of Disulfiram. It also includes supplementary care tailored towards the specific needs of clients, such as replacement of electrolytes, multi-vitamins, and other prescribed treatments such as anti-depressants, antacids or anti-epileptic drugs. On the cessation of withdrawal symptoms, which usually takes between two to four days, participants enter in the psycho-social program that includes individual counseling, group therapy, family program and prayer & educative session.

Individual counseling

During their time at the camps, individuals participate in a 15-20-minute counseling session conducted daily by trained psychologists. During the first session, the counselors collect detailed information from each client regarding their demographic background, family history, social environment, drinking habits and alcohol-related problems faced by the clients and their families. The initial sessions are tailored towards motivating clients to achieve short term goals such as maintaining abstinence, addressing drinking related problems, and making positive lifestyle changes. Sessions conducted towards the end of the treatment program emphasize mainly on finalizing recovery plans, strengthening the

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motivation for maintaining abstinence, improving interpersonal relationships with family members and learning problem solving skills. Before the final discharge, the counselors evaluate their clients for any withdrawal symptoms, levels of motivation, commitment towards treatment goals and available social support.

Group therapy

Along with the individual counseling sessions, clients also participate in daily hour-long interactive group sessions also conducted by a trained counselor. Each group consists of eight to nine clients. Clients receiving individual sessions from the same individual therapy counselor are grouped together. This helps the counselors to gain better understanding of their clients and build a trusting relationship between the counselors and their clients. Each day the counselors pick a topic, such as worst drinking experiences, previous attempts of drinking cessation, job and family problems, and personal emotions and feelings associated with drinking, and encourage the participants to share their views and opinions. The purpose of these sessions is to help clients to break their initial phase of denial, and provide an opportunity to assess their own behavior as well as give feedback on others. Group sessions also provide a platform for the clients to share their personal experiences, socialize, develop new skills, and reduce the feelings of shame and guilt.

Family programs

Studies conducted among western populations have shown that involving family members in alcohol treatments helps to - a) improve marital relationships, and decrease the incidence of separation, divorce, or domestic violence (O'Farrell & Fals-Stewart, 2000), and b) increase the engagement of clients in the treatment process and boosts the retention rates (Stanton & Shadish, 1997). In addition, a randomized controlled trial (RCT) conducted by Nattala and colleagues (2010) among alcohol dependent clients (N=90) admitted at a de-

addiction center in Bangalore, India confirmed that alcohol treatment outcomes improve

significantly with the involvement of family members. Results showed significant reductions

in drinking frequencies and alcohol-related problems of Dyadic Relapse Prevention (DRP,

i.e., client plus one family member) participants compared to the individual relapse

prevention (IRP i.e., client only) and treatment as usual (TAU) participants at the 6-month

follow-up. During the early treatment camps, Cherian (1989) observed that several clients

were accompanied to the treatment center by at least one family member who showed

interest in the treatment process and were ready to help in every possible way. Thus, given

the importance of families in alcohol treatment, at least one family member is encouraged to

participate with clients in the Individual counseling sessions of camp treatment.

On the other hand, family members often complain about feeling guilty, ashamed,

angry, sad and/or isolated from society because of the presence of an alcohol user in their

families. Therefore, to educate the family members about alcohol problems and recovery

process, help to share their feelings and reduce the pain caused due to the client's drinking

behavior, an 11-day program is organized for the family members during the treatment

period. This program includes educational lectures from field experts and group sessions

exclusively for family members. It also provides an opportunity to amend their marital

relationships and develop trust and a caring attitude towards the clients.

Prayer and educative session

The *spirituality* component of Alcoholics Anonymous has also been incorporated into

the camp treatment program in the form of prayers. Two prayer sessions are conducted every

day to strengthen clients' belief in God (or "higher power"), and provide additional

emotional support during the recovery process. The prayer session is also accompanied by

moral based stories. Since a majority of clients attending de-addiction camps are either Hindu

or Christian, simple value based stories from ancient Hindu scriptures and the Bible containing messages such as "care for the family", "importance of hard work", "trust in God", "importance of savings" etc., are narrated by counselors to instill positive values and thoughts among clients. In addition, as a part of these educative sessions, trained counselors' present actual case studies in a comprehensible manner to the clients to emphasize the significance of positive lifestyle changes.

Post-camp/follow-up activities

Continued and sustained care is an integral component of post-camp activities. A trained counselor visits the communities where the camps were conducted once a month for 12-months post- treatment to conduct follow-up assessments. Extensive efforts (letters, phone calls and/or home visits) are made to reach-out to the clients to encourage them to attend the follow-up visits. Community and family members are also held responsible for bringing the clients for regular follow-ups. During the visits, the client's progress in terms of maintaining abstinence and addressing alcohol-related problems is assessed using a semi-structured questionnaire. In addition, participants receive their monthly supply of Disulfiram and are encouraged to continue the medication to prevent relapse.

In the past three decades, several clients have been treated through de-addiction camps conducted in different parts of the country. However, studies examining the "treatment effectiveness" of these camps are scarce. Some preliminary studies have described de-addiction camps as culturally sensitive, cost-effective, and better than rural hospital based care (Chavan & Arun, 1999; Chavan et al., 2003; Chavan & Gupta, 2004; Cherian, 1989; Raj, Chavan, & Bala, 2005; Ranganathan & Cherian, 1994). However, findings of some of these studies are based on non-experimental study designs such as case studies and clinical observations such as Cherian (1989), and Ranganathan (1994). The methodological and

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statistical limitations of these studies limit the ability to confirm the effectiveness of these camps.

The first study examining camp treatments was a report based on clinical observations published by Ranganathan (1994). Besides providing detail description of camp treatments, the study provided preliminary findings of 105 alcohol dependent clients who were treated through de-addiction camps between 1989 and 1992. It was found that 83% of the study sample remained abstinent up to 12-months post-treatment. The average age of participants was 40 years (range 24 to 62 years), 91% were married, 94% were Hindus, and 66% were less educated. Participants were mostly involved in heavy drinking for more than five years. The study also highlighted some key factors, such as inspiration from the ex-users and community members, strong belief in god, respect for the host organizations, close knit family structures of Indian villages, and community participation that contributed towards the success of these camps in rural areas. Though, such preliminary information is critical for the purpose of developing and implementing treatment programs, it lacks the robustness to support the effectiveness of actual treatments.

The most recent study examining de-addiction camps provided some supportive evidence for the treatment. Chavan and colleagues (2003) compared the treatment outcome among substance abuse clients receiving treatment in camp settings with those admitted at a de-addiction center. The multiple-group pretest-posttest design was utilized to collect data from the study sites. A total of 67 participants from three different camps conducted between 1997 and 1999 were compared with those receiving substance abuse treatment in a government hospital located in the same geographical area as the camps (n= 44). De-addiction treatments in both settings included pharmacological treatment, psycho-educative

group sessions, family sessions and recreational and religious activities. However, the treatment duration in camp settings was much lesser than (10 days) than the average duration of the hospital stays (12 days). Treatment outcome (i.e., proportion of complete abstainers) was assessed at 3 months based on the clinical assessments conducted by a senior consultant.

Results showed the 3-month abstinence rate (69.0%) and retention rate (100%) were better among the camp participants than the hospital clients (41.0% abstinent; 82% retention). Hospital clients, however, showed lesser withdrawal symptoms compared to camp participants. Though, the camp treatment showed some benefits over the hospital-based care, the study had several limitations. First, both study groups significantly differed on several baseline characteristics, some of which are known to be associated with alcohol use. Camp participants were older (Mean age= 38, SD=12.3 years), and less educated compared to hospital clients (Mean age= 32.3, SD=9.0 years; $p < 0.05$). Treatment camps (72.0%) had more number of married participants than the hospital (61.4%). In addition, though the proportion of employed clients was high in the camp setting, most of them came from lower socioeconomic backgrounds compared to the hospital-based clients. Second, significant proportion of participants from the hospital setting suffered from severe co-morbid psychiatric conditions than the camp participants ($p< 0.005$). Most important, the groups differed significantly on the type of substance used ($p< 0.005$), and the duration of drug dependence ($p< 0.01$). The proportion of alcohol and opium dependents was high among camp settings. Similarly, the mean duration of drug dependence high among the camp participants (M=14.2 years, SD=10.4) compared to the hospital group (M=8.6 years, SD=7.7). The study also showed some methodological limitations such as non-random assignment of the participants, non-equivalent study groups, lack of structured treatment

manual, different treatment duration in both settings, shorter follow-up period, and lack of standardized measures to assess the outcome.

Summary

In the past, few decades, there has been significant growth in substance use and associated problems in India. Alcohol and tobacco are the two commonly abused substances by majority Indians. In addition, alcohol is becoming increasingly popular among women and youth in India. Studies have consistently reported a high prevalence of drinking and alcohol use disorder among middle-age men, those residing in rural and underserved areas, and lower socio-economic groups. Several factors, such as early age of initiation, positive drinking attitudes, poverty, stressful lifestyle, changing socio-political environment and media influences, appear to play a significant role in the growth of drinking problems among Indians.

Alcoholism is treated as a multi-phasic illness by researchers and clinicians in India, and includes pharmacological, psychological, and sociocultural components. At present, alcohol treatment is mostly provided through special de-addiction clinics established by the Government of India, district-level hospitals and few community clinics. Some private psychiatric clinics and non-profit organizations also provide alcohol treatment. However, several clients, especially those living in rural and underserved areas, are deprived of treatment due to barriers including the location of these clinics, travel and treatment costs, and/or unawareness of treatment availability.

To address these barriers, the Government of India along with some non-profit organizations started offering de-addiction treatment through mobile units, known as "*de-addiction camps.*" The primary goal of these camps is to identify clients from communities and provide free alcohol treatment at their doorstep. In addition, the camps create awareness

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by educating the clients and family members about the negative consequences of alcohol and increase social support for the recovering addicts by involving community members, families, social workers and local doctors in the recovery process. Preliminary studies provide preliminary support for the cost-effectiveness and viability of de-addiction camps. That said, empirical reports examining the effectiveness of de-addiction care in rural areas in India is virtually non-existent. Moreover, methodological and statistical limitations of previous studies limit their interpretability and generalizability. Therefore, the overarching aims of this study will be to (1) evaluate the treatment effectiveness of rural de-addiction camp, and (2) examine the determinants of treatment outcome and the recovery process at these camp settings.

Theoretical Framework

Alcohol treatments available at most treatment clinics in India are based on the *biopsychosocial model* (Engel, 1978). The camp treatment uses the Minnesota model for (Anderson et al., 1999), which is like the *biopsychosocial model,* and includes individual and group interventions, family support and other supportive therapies such as meditation, motivation and support from recovered clients and educational sessions. This treatment package help clients to achieve the treatment goal, i.e., complete abstinence, and create an environment that would motivate them to maintain abstinence for longer periods. Due to the holistic nature of these treatments, *biopsychosocial* and *ecological* theories provide a rationale to examine the association between individual and environmental factors and treatment outcome among camp participants.

Biopsychosocial theory

Proposed by Engel during 1960s, the biopsychosocial model stated that, in addition to physical elements, components such as soul, mind, behaviors, and environment contribute

equally to the development of various illnesses (Engel, 1978). The model suggested that the levels of organizations related to health and diseases are arranged in a hierarchical order of their complexity. The complex or larger units like the families, communities, cultures/subcultures, societies/nations and biosphere "super-ordinates" smaller or less complex units such as the person, organ systems, organs, tissues, and cells (Engel, 1981). Though the systems in this hierarchy are relatively independent and bounded by their unique qualities, they are also interconnected through information flow and feedback arrangements. Therefore, disturbances created in one system level could affect other systems, disturbing the coherence, resulting in their dysfunction and leading to unhealthy conditions.

Ecological theory

This theory was also proposed in early 1970s by Bronfenbrenner. Including similar concepts as the biopsychosocial model, the ecological theory explained the processes and conditions that influence the course of human development in the environment that they live. It stated that, throughout the lifetime, the course of human development is governed by the mutual interactions between the individual and his/her "ecological environments." Such interactions are known as "proximal processes". The strength and direction of the effects caused by such proximal processes on human development depends largely on the characteristics of the developing individual, the environment in which the processes take place and the nature of the developmental outcomes (Bronfenbrenner, 1994).

Figure 1. Nested structure of ecological model

Bronfenbrenner's Ecological Systems Theory

Chronosystem
Changes Over Time

Macrosystem
Social and Cultural Values

Exosystem
Indirect Environment

Mesosystem
Connections

Microsystem
Immediate Environment

CHILD
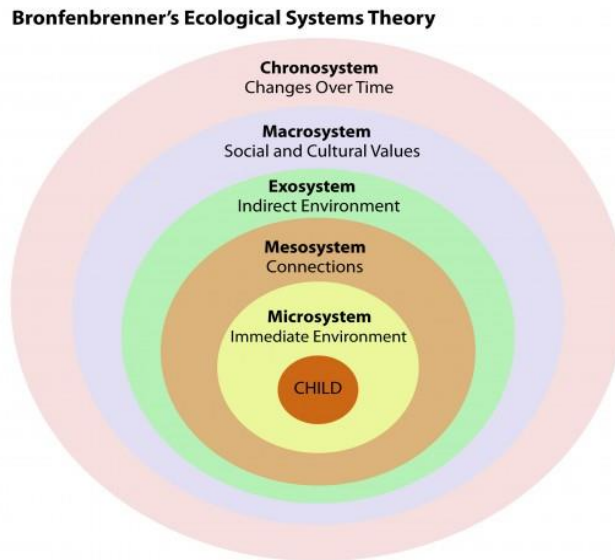
As shown I figure 1, the ecological environments are perceived as a set of nested structures and referred as (from inside-out) – *microsystems, mesosystems, exosystems, macrosystems* & *chronosystems*. *Microsystems* are the immediate environment of the individual (for ex: Family, friends, school or work place) and includes the activities, social roles and interpersonal relations shared by the individual with this environment. The *mesosystem* includes the connections and interactions taking place between two or more microsystems. For instance, for an adult human being the interaction taking place between their home and workplace or home, friends and workplace. The *exosystems* comprises of the interactions that take place between two or more settings, one of which is not directly related to the individual. For example: for a parent, the interaction between their child's school and neighborhood-community. The *macrosystem*, on the other hand, is a broader system that

includes culture/subculture, belief systems, customs, lifestyles, etc. and their impact on human development. Finally, the *chronosystem* expands the parameter of the environment into a third dimension. It includes the changes and/or consistencies in the characteristics of the individual and the environments over time. For instance, changes throughout the life course in socioeconomic status or family structures or employment status, or lifetime stress levels, etc. (Bronfenbrenner, 1994).

Based on these theoretical frameworks, this study evaluated the association between several individual-level (age of initiation and other drug use) and environmental-level (family h/o addiction, relationship with family members, ACEs, and religiosity) factors on the behavior (drinking status before and after treatment) of clients participating in de-addiction camps. The primary goal of the proposed study was to determine the determinants associated with sobriety of camp participants.

CHAPTER III: METHODS

Overview of Research Design

The proposed study involved the secondary analyses of deaddiction camps data obtained from the T.T. Ranganathan Research Center, Chennai, India. These data include detailed information on adult alcohol users who participated in six de-addiction camps conducted in *Manjakuddi* village between 2004 and 2009. Data was collected by trained psychologists using a semi-structured questionnaire in a pretest-posttest manner, i.e., at baseline and at 12-months post-treatment. The pretest-posttest design is the simplest research design which measures the outcome of interest before and after treatment/s. There is no control/comparison group in this design. The research subjects serve as their own control, and it is presumed that differences between the pretest and posttest measurements are associated with the treatment (Spector, 1981). Due to lack of comparison group or random assignment of the research subjects, such designs are vulnerable to internal validity threats, such as *history*, *maturation*, *instrument reactivity* and *Hawthorne effect*. Nonetheless, due to its simplicity and ability to be carried out with limited resources, this design is often utilized to evaluate the preliminary effects of the treatment programs (T. D. Cook & Campbell, 1979; Spector, 1981).

Sample Population

The current study sample included 176 alcohol users who participated in six different treatment camps conducted in Manjakkudi village between 2004 and 2009. Manjakkudi is a small village (651 households) in the Thiruvarur district of Tamil Nadu, South India. According to the 2011 census report, half of the total population (2,503) in Manjakkudi were men and 44% belonged to lower (i.e., "*Scheduled*") caste (http://www.censusindia.gov.in/pca/SearchDetails.aspx?Id=694904). Manjakkudi is known

as the "educational hub" of the Thiruvarur district and is one of the few villages in India that contain higher educational facilities. Literacy rates in Manjakkudi are high (77.5%), however, only 41% of the total population are engaged in work activities. Ninety-eight percent of this working population is employed at least 6 months in each year but on lower daily wages as agricultural laborers or industrial workers. A small proportion (5%) are cultivators and own an agricultural land (http://www.census2011.co.in/data/village/637965-manjakkudi-tamil-nadu.html).

Measures

Detailed information was collected from camp participants at baseline using a semi-structured questionnaire administered by trained counselors in a face-to-face interview. The questionnaire included information regarding the client's socio-demographic background, drinking history, family history and various problems associated with alcohol use. Follow-up visits were conducted by trained counselors every month to monitor clients' progress and distribute the monthly supply of Disulfiram. Recovery status, i.e., period of complete abstinence (in months), was recorded at the end of 12-months. This was used as the indicator of treatment outcome.

Demographic characteristics

Socio-demographic characteristics including age (age range and average age with standard deviation), religion (Hindu, Muslim, Christian or others) educational status (no formal education, less than high school, high school and above), marital status (married or single) and income were examined for all participants at baseline.

Baseline alcohol use

Alcohol use (i.e., total quantity consumed per day) and types of beverages (i.e., whisky, beer and *arrack*) consumed were recorded for each participant at the time of admission. Based on this information, a total number of standard drinks consumed per day was calculated for each participant and used as an indicator of baseline alcohol use. The following formula designed for alcoholic beverages available in India was used to calculate standard drinks:

One standard Drink = ½ bottle of Standard Beer or ¼ bottle of Strong Beer = 1 peg (30 ml.) Spirits = ½ packet (40 ml.) of Arrack = 1 glass (125 ml.) of table wine = 1 glass (60 ml.) fortified wine (*Note: In India, a standard drink corresponds to 10 ml absolute alcohol;* (Lal & Gupta, 2007).

Age of initiation (AOI) of alcohol use

At baseline, each client was asked to report their approximate age (in years) at which they had their first drink (more than few sips).

Alcohol use disorders (AUDs)

At baseline, clients were assessed for severity of alcoholism symptoms using a Tamil version (the regional language) of the Munich Alcoholism Test (MALT), developed and tested previously by the treatment providers (Ranganathan & Cherian, 1994). Like the original MALT, a translated version showed high reliability (r= 0.77) and internal consistency (0.74) in this population (Ranganathan & Cherian, 1994). The MALT, originally developed by Feuerlein, Ringer, Kufner and Antons (1979), utilizes the WHO description of alcoholism and consists of following two components- 1) a 7-item *medical component* that includes physical examination, laboratory tests and detail medical history, and 2) a 24-item *self-assessment scale* that assesses the participant's drinking behaviors, attitude towards drinking, emotional and social impairment due to alcohol use, and other somatic complaints.

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Each item on the medical component is weighted with a score of 4 whereas each item on the self-assessment subscale receives a score of one. A total score is calculated by summing all items on the subscales. Scores between 6 and 10 are indicative of alcoholism symptoms and a score of 11 or higher confirms the diagnosis of alcoholism. The camp data available for the current study, however, included only the self-assessment subscale. Therefore, a total score was calculated by summing the scores on individual items of the self-assessment subscale. Higher score indicated more severe problems.

Tobacco use

Tobacco use included both smoking and chewing tobacco. For final analyses, Smoking and chewing tobacco were combined in one dichotomous variable (Yes/No).

Family History of (H/O) addiction

Participants were asked "if any close family members (living or dead) were addicted to alcohol/drugs?" 0- "No" to 1- "Yes"

Adverse childhood events (ACEs)

At baseline, each participant was asked "whether (yes/no) they had experienced any of the following situations before the age of 15 years" – *1) poverty/severe debts; 2) early parental loss; 3) extra-marital affairs of parents; 4) broken home/single parenting; and 5) violence in the family*. The inter-correlations of these related variables were examined. Based on these results and available literature, an informed decision was made to calculate a total score and include in the final analyses model. Higher score indicated greater number of traumatic childhood events.

Interpersonal relationships with family members

Clients' current relationship with their spouse, children, parents, and siblings were assessed separately at baseline on a 3-point scale ranging from 0 "supportive" to 3 "mutual rejection." The intercorrelations of these related variables were examined. Based on the

results, it was decided to sum the responses and include as a total score for interpersonal relationships in final analyses.

Religiosity

Clients' religious involvement was assessed by asking: 1) "*do you visit temple regularly*?" 2) "*do you go to pilgrimages*?"; 3) "*do you celebrate festivals*?" and 4) "*do you have regular prayer at home*?" Responses were recorded on a 3-point scale, ranging from 0 "never" to 3 "frequently." The intercorrelations of these related variables was examined. Based on the results, it was decided to create a mean total score across the four questions for final analyses.

Treatment outcome

Since complete abstinence was the primary goal of camp treatments, trained counselors monitored the client's recovery status during the monthly follow-up visits and reported the total period of sobriety (in months) at the end of 12-months. As such, the total period of sobriety was utilized as the treatment outcome variable in the current study (range from 0 to 12 months of sobriety).

Data Management

Data obtained from the TTK Center was de-identified. To protect participants' privacy and confidentiality, all known personal identifiers such as client's name, address, and contact information were removed from the data set. Each client was assigned a unique identification (ID) number before exporting the data to analytic software for further analyses. The excel file linking ID numbers with patients' original information was stored on a password protected computer in a locked office of the researcher at the Florida International University, Modesto A. Maidique campus (FIU-MMC) and was accessed, if necessary, only by the researcher and/or her dissertation chair. Additionally, all data was stored in locked file

drawers at each stage of data transfer and no participant was identified in any reports or

publications. Initial data cleaning and coding was done in SPSS version 20.0. The editing and

coding procedures were documented using data logs created in Microsoft excel.

Analytic Strategy

Preliminary analyses

   This examined the socio-demographic characteristics of the TTK de-addiction camp

participants (**Aim 1**) using SPSS version 20.0. This included frequencies and proportions of

various demographic variables, social characteristics, alcohol use, and associated problems.

The demographic characteristics of the current study population was further compared with

the Indian general population, as well as, the Indian alcohol users' data obtained from the

2003 world health survey (WHS) published by the World Health Organization to determine

the resemblance between these populations. The World Health Organization had developed

and implemented a Survey Program known as the World Health Survey (WHS) to compile

comprehensive baseline information on the health of populations and on the outcomes

associated with the investment in health systems; baseline evidence on the way health

systems are currently functioning; and, ability to monitor inputs, functions, and outcomes.

The World Health Survey has been completed in 70 countries and the data sets have been

cleaned, weighted and prepared for analysis by country teams.

Regression analyses

   The association between age of initiation, family H/O addiction, ACEs, relationship

with family members, religiosity and baseline alcohol use (AIM 2) as well as period of

sobriety at 12-months post treatment (AIM 3) were analyzed as separate multivariate

regression models in MPLUS 7.0. Using MPLUS allowed for a variety of elegant and

powerful statistical tools to accommodate missing data. Although missing data was minimal

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for most variables and ranged between 1-10%, parameter estimates and model tests were pursued in the context of Full Information Maximum Likelihood (FIML) methods as implemented in MPLUS to accommodate missing data.

Ethical Considerations

The de-addiction camp data were collected and maintained by the T.T. Ranganathan Clinical Research Institute and are not open for public use. Therefore, all necessary procedures were followed to obtain data usage permission for secondary analysis from this organization. In addition, since the researcher belonged to Florida International University, a study proposal was submitted to the University's Institutional Review Board (FIU IRB) for approval. As the study involved secondary analyses of de-identified data, it was anticipated to fit the "expedited review" criteria for IRB approval. Data obtained from the T.T. Ranganathan Institute was stored on a password protected computer in the researchers' office located at FIU-BRIDGE. Only researcher and her dissertation chair had access to this data. Precautions were taken to protect the privacy and confidentiality of study participants. In addition, none of the participants were identified in any reports or publications.

CHAPTER IV: RESULTS

This chapter presents the findings of the quantitative data obtained on 176 male alcohol users receiving treatment at the de-addiction camps conducted by T.T. Ranganathan clinical and research center at Manjakuddi, south India between years 2004 and 2009.

Table 1. Socio-demographic characteristics of the sample (N=176)

Mean age *(SD)*in years	37.48 (7.06)
Religion (%)	
Hindu	88.6%
Christian	7.4%
Caste (%)	
Brahmin	3.4%
Forward caste	1.1%
Backward caste	67.0%
Scheduled caste/tribes	26.1%
Educational status (%)	
No formal education	12.5%
Less than high school	74.0%
High school & above	11.4%
Marital Status (%)	
Single	5.1%
Married	93.1%
Employment status (%)	
Full time	88.1%
Part time	5.7%
Unemployed	4.5%
Mean (SD) monthly income in USD (1U*SD=64.38 Indian Rupees*)	55.6873(68.76)
Family H/O addiction	49%
Adverse Childhood Events	
Family violence	25.6%
Parental loss	24.4%
Poverty	43.8%
Single parenting	9.1%
Parent's extramarital	5.7%

Table 2. Prevalence of Predictors of baseline alcohol use (N=176)

Predictors	Prevalence
Standard drinks consumed/day	
Range	0.5-12 drinks
Mean (SD)	8.63 (3.50)
Alcohol Use Disorders	92.00%
Age of Initiation	
Range	8 to 43 years
Mean (SD)	19.94 (5.70)
Tobacco use (% smoking/chewing)	81%
Positive Family History of addiction	49%
Adverse childhood events	67.40%
Family violence	25.60%
Parental loss	24.40%
Poverty	43.80%
Single parenting	9.10%
Parent's extramarital	5.70%
Supportive relationship with family members	
Spouse	42.60%
Children	42.60%
Parents	22.70%
Siblings	20.50%
Religious involvement	89.20%
Pilgrimage	13.60%
Visiting temple	36.90%
Praying God	55.10%
celebrating festivals	43.80%

Aim 1

Table 1 presents the demographic characteristics of the sample population.

Participants were all male with the average age of 37.48 years [range: 20-53 years]. Most of

the sample reported belonging to the Hindu religion (88.6%) and the backward caste (67%).

Almost three-fourths of the sample had less than a high-school education (74%). A majority

were married (93.1%) and had a full-time job (88.1%) but with an extremely low average

monthly income [Mean (SD)= $55.68(68.76)]. Almost half of the population were poor and

reported family H/O addiction. A third of the sample (32.4%) showed at least one adverse childhood event.

Table 2 describes the prevalence of individual and environmental predictors among the camp sample. Heavy drinking was common among this sample. Though, the average number of drinks consumed per day were 8 drinks, majority of the sample reported consuming 12 standard drinks per day. While 92% of the sample qualified for alcohol use disorders, tobacco in the form of smoking or chewing was another commonly abused drug by this sample. The mean age of alcohol initiation was almost 19 years. However, some clients reported starting alcohol use as early as 8 years. Almost half of the sample reported positive family history of addiction. Around 44% had experienced poverty before the age of 15 years, 43% had supportive family members and more than half of the sample were involved in religious activities i.e. praying God.

In addition, the current study sample was compared on religion, and caste with the general population data obtained from the 2011 Indian Census data and other socio-demographic information such as age, gender, educational and marital status obtained from the national data on alcohol users' collected by the 2003 World Health Survey conducted by the World Health Organization (WHS; N=1019;(World Health Organization, 2003). Results showed that the de-addiction camps sample had a higher number of participants who were Hindu (88.6%), or Christian (7.4%) religions compared to the general population data (80.5% followers of Hindu religion, 13.4% Muslims and 2.3% Christians (Office of the Registrar General & Census Commissioner, India, 2001). In terms of caste, the Backward caste was slightly overrepresented in the study sample (67%) as compared to the general population (41%; (vanamalai, accessed on 2017).

The study sample was found to be highly representative of alcohol users in India on a variety of socio-demographic characteristics when compared to the Indian World Health Survey (WHS; (World Health Organization, 2003). Most users from both data sets were middle-aged. Specifically, the average age of the population in the WHS data ranged between mid-30s (37.48 years (SD=7.06)) and mid 40s (46.85 years (SD=14.23)). Almost 100% of respondents from both the study sample and the WHS were male (99.8% in WHS). Similarly, most men from both studies were married (89.1% in WHS). Both groups reported similar educational levels -- specifically 86.5% of the study sample and 88% of WHS participants reported 'no' or 'less than high school' education.

Although no daily alcohol consumption rates are reported in the WHS data set, a recent study reported the patterns of alcohol consumption in a similarly poor rural section of India, the Sehore District in Madhya Pradesh (N=3220). Specifically, Rathod et al., (Rathod, Nadkarni, Bhana, & Shidhaye, 2015)2015) found nearly 1 in 4 men in rural areas reported alcohol consumption in the past year of which 33.2% reported hazardous drinking. Furthermore, (Girish et al., 2010) examined the alcohol use patterns of adults (N=28,507) in India across 4 separate communities and found that in rural areas, nearly half of them consumed alcohol on daily basis. As such, the alcohol consumption rates reported at baseline by the present study's sample appears consistent with the general rural Indian population that consumes alcohol.

Figure 2. Proposed SEM model for predictors of baseline alcohol use

Figure 3. SEM model for significant predictors of baseline alcohol use
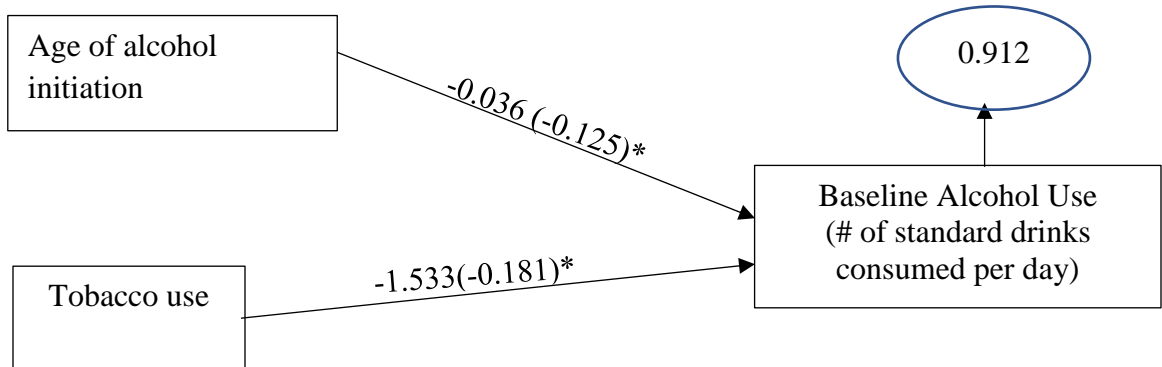
Notes: Values represent unstandardized coefficients. Values inside parentheses represent Standardized coefficients. Value in circle indicates unexplained variance in the observed variable (E_1). Note: *$p<0.05$.

Aim 2

Figure 2 shows the model analyzed to examine Aim 2 with the Mplus (version 7)

statistical software using a maximum likelihood algorithm. The model was just identified;

therefore, model fit indices were uninformative. A normality assessment was conducted prior to analysis. Multivariate normality was evaluated using Mardia's test. The multivariate coefficient was not statistically significant, indicating that the data were normally distributed. Univariate examination of the model's endogenous variable (Baseline alcohol use) was consistent with normally distributed data (skewness = -0.44 and kurtosis = -1.27). The residual variance for the endogenous variables are presented in standardized form and indicate the proportion of unexplained variance in the outcome variable.

The significant standardized and unstandardized (in parentheses) path coefficients are presented in Figure3. The mean age of alcohol initiation ($p<0.05$) and tobacco use were statistically significantly ($p<0.05$) related to baseline alcohol use. Results revealed that, after controlling for family H/O addiction, Adverse Childhood Events, relationship with family members, and religiosity, a one unit decrease in the mean age of alcohol initiation increased the total number of drinks consumed at baseline by 0.117 units on average. Unexpectedly, after controlling for the age of initiation, family H/O addiction, Adverse Childhood Events, relationship with family members, and religiosity, the mean score of baseline alcohol use was higher among non-tobacco users. Lastly, also shown in Figure 3, approximately 10.0% of the variance in baseline alcohol use was explained by the model.

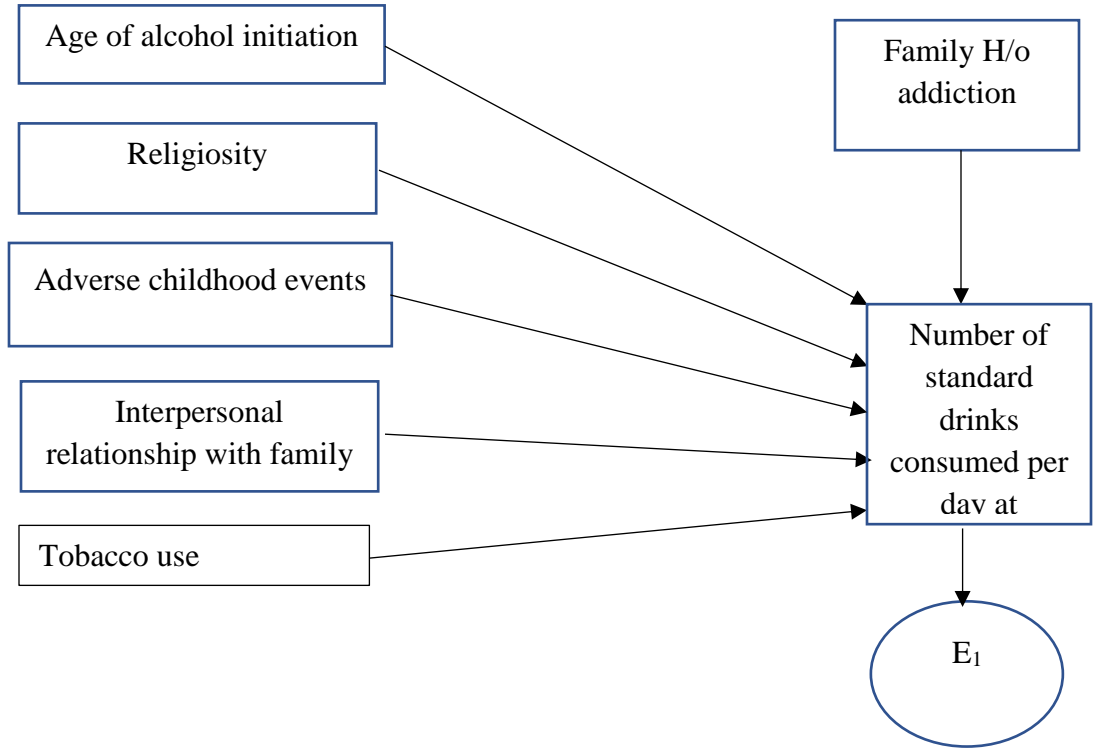Figure 4. Proposed SEM model for post treatment sobriety
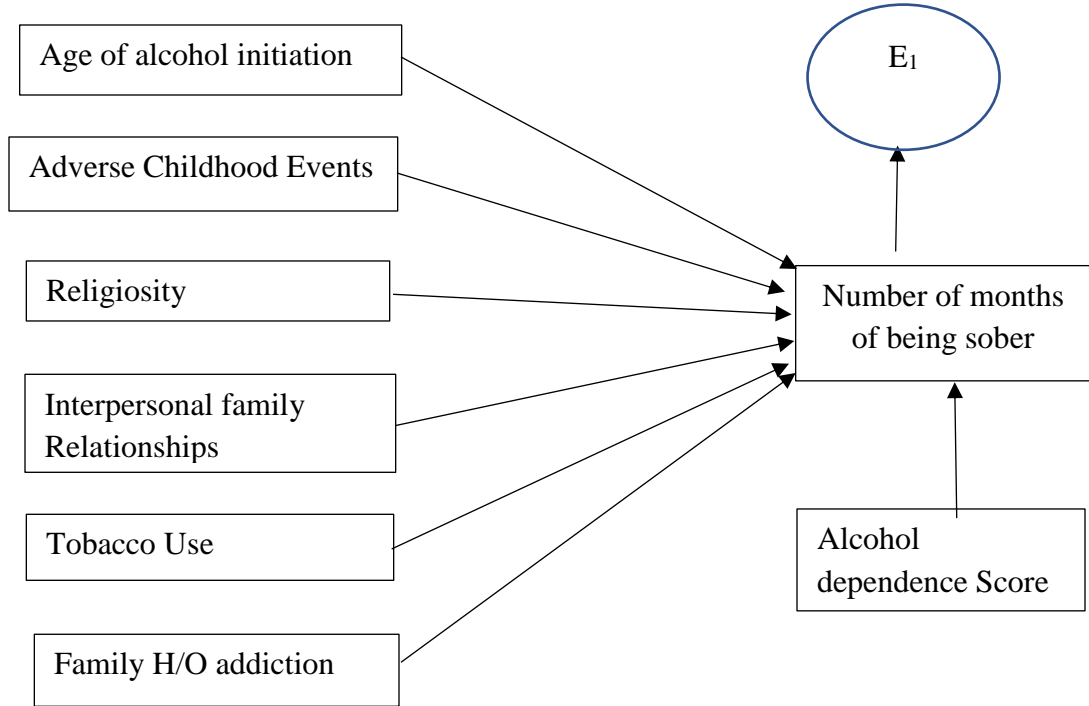
Figure 5. SEM model for significant predictors of post-treatment sobriety
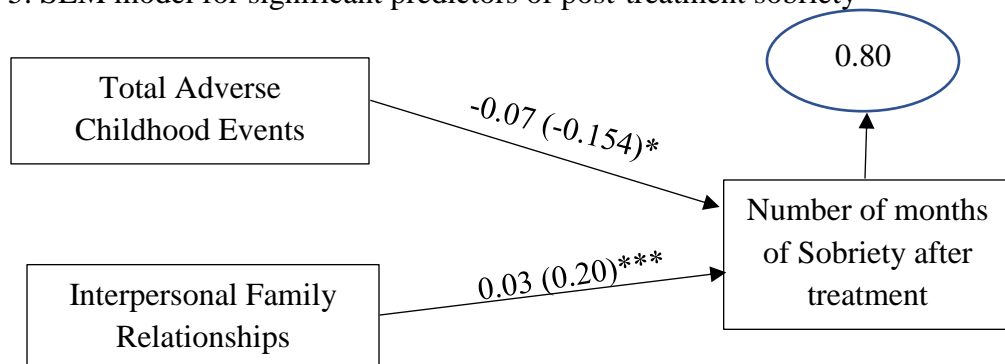
Notes: Values represent unstandardized coefficients. Values inside parentheses represent include Standardized coefficients. E1 Value in circle indicates unexplained variance in the observed variable (E1). *p<0.05; ***p<0.01.

Aim 3

Determining the association between the period of sobriety at 12-months post

treatment and age of initiation, family H/O addiction, Adverse Childhood Events,

interpersonal relationship with family members, religiosity and alcohol use disorders. Figure

4 shows the model analyzed to examine Aim 3 with the Mplus (version 7) statistical software

using a maximum likelihood algorithm. The model was just identified; therefore, model fit indices were uninformative. A normality assessment was conducted prior to analysis. Multivariate normality was evaluated using Mardia's test. The multivariate coefficient was not statistically significant, indicating that the data were normally distributed. Univariate examination of the model's endogenous variable (post treatment sobriety) was consistent with normally distributed data (skewness = -1.42 and kurtosis = .74). The residual variance for the endogenous variables are presented in standardized form and indicate the proportion of unexplained variance in the outcome variable. Approximately, 20.0% of the variance in sobriety was explained by the model.

The significant standardized and unstandardized (in parentheses) path coefficients are presented in Figure 5. Adverse Childhood events (p<.05) and interpersonal relationships with family members (p<.01) were both statistically significantly associated with sobriety. Results revealed that, when the effect family H/O addiction, relationship with family members, religiosity, and alcohol use disorders were held constant, on average a one unit decrease in the adverse childhood events increased the likelihood of post treatment sobriety by 0.07 units. Similarly, holding the effect of age of initiation, family H/O addiction, Adverse Childhood Events, religiosity and tobacco use constant, one unit increase in the relationship with family members increased the likelihood of post treatment sobriety by 0.03 units.

CHAPTER V: DISCUSSION

This chapter discusses the findings of this study and their implications for social work practice and policy. Additionally, the limitations of this study and its significance to the fields of social work and public health are discussed in detail.

Findings

The present study is amongst the first examining the key indicators of alcohol use and determinants of treatment outcome among adult male alcohol users attending a de-addiction camp in rural India. Results revealed that most of the men were middle-aged, married, poorly educated, and employed full time but with a low monthly income. As expected, heavy alcohol use was common among the sample. Almost 44% of the sample reported consuming 12 or more standard drinks per day. The majority (70%) also reported consuming tobacco of some kind. In addition, 83% scored high on the SADD scale indicating high alcohol dependence. Nearly, half (49%) of the sample had a positive history of family addiction and more than half (66%) reported one or more adverse childhood events. Finally, camp treatment appears to be efficacious for 2/3 of patients; 68% of the sample (N=176) were reported to have remained sober at the end of 12 months' post treatment.

Regarding indicators of baseline alcohol use, consistent with the literature, age of early alcohol initiation was found to be significantly associated with alcohol use at baseline. By contrast, contradicting a previous study (Rani, Bonu, Jha, Nguyen, & Jamjoum, 2003), our study found alcohol use to be higher among those who reported no tobacco use. Since chewing tobacco is very common in India, when asked about tobacco use, some clients might use of chewing tobacco and fail to report smoking. This informational bias could mask the

actual effect of smoking and might be the reason for counterintuitive negative relation

between tobacco and alcohol use.

Implications for social work practice

Findings from this study are significant for social work practice. The current research

highlights several important individual and environmental factors that could influence the

drinking habits and treatment outcomes among adult Indian men. Given the increasing

problems caused by substance abuse among Indians, and the dearth of treatment for Indians,

medical and non-medical professionals need to have a thorough understanding of this

problem. This includes consideration of the multifactorial contexts and environments that

influence treatment entry, response, and long-term success; improved understanding of these

contexts and environments is necessary for designing cost-effective treatment options. A

negative association between age of alcohol initiation and alcohol use indicates that the trend

of substance abuse is shifting earlier in the lifespan, and speaks to the need to tailor the

education and preventive efforts towards a younger Indian population.

As described by SAMHSA (2017) adverse childhood experiences (ACEs) are

stressful or traumatic events that occur in the life of an individual at an early stage. Studies

have discussed how Chronic exposure to stressful events could disrupt the cognitive and

emotional impairment of the child, often leading them to adopt risky behaviors such as

substance abuse as a coping mechanism. ACEs are shown to be associated with variety of

risky behaviors including substance abuse and psychosocial problems. Therefore, preventing

ACEs and early identification of people who have experienced them might have a significant

impact on critical health problems. The association between ACEs and period of sobriety

seen in the current study indicates that ACEs have cumulative effect on treatment outcome.

The trauma caused by ACEs can significantly reduce the period of sobriety. It is possible that treatment programs designed to prevent drinking may not work as intended unless they help clients to recognize and cope with stressors associated with such adverse events.

Hence, it is essential that social workers and treatment providers should be trained in early identification of ACEs and identifying groups that might be at higher risk of developing substance use disorders. Substance abuse prevention and treatment efforts could be strengthened by creating awareness about the ACEs, and including them as risk factors while investigating health-risk behaviors.

In addition, the positive association between interpersonal relationship with family members and treatment outcome indicates that families play a very important role in an individual's life, treatment providers should also consider educating friends and family members to increase available support during the treatment process and guarantee long-lasting treatment effects.

Policy implications

Findings of the present research are very important from the policy perspective. Currently, there is no national policy to prevent alcohol use in India. Alcohol and illegal drug prohibition has been included in the constitution as a directive principle. However, it is up to the individual states to design their own policies. This encourages illicit use and trade of illegal alcohol and drugs across the state borders. Few studies conducted in the past decades have highlighted the ill-effects of substance abuse in this population. Studies have shown (Nagpal et al., 2006; Prasad, 2009) that 18% of psychiatric emergencies, more than 20% of all brain injuries, and 60% of all injuries reporting to India's emergency rooms were related to substance abuse. In addition, a 2004 WHO study (Jeyaseelan et al., 2007) showed that a

third of the domestic violence cases in India were associated with alcohol use, and majority of the violence took place when the husbands were under intoxication. Despite the growing evidence, very few studies discuss the demand reduction strategies and treatment approaches in this population. The current study's findings highlight the critical need for India to develop and implement comprehensive policies as well as effective prevention strategies.

Study Limitations

The study had several limitations. First, the study utilized secondary data obtained from alcohol users participating in treatment camps between 2004 and 2009. Since these data were collected using a pre-post design and lacked any comparison (or control) groups, there remains a potential threat to the internal validity of this study. However, as mentioned earlier, due to such research design's simplicity and ability to be carried out with limited resources, they often are utilized to evaluate the preliminary effects of treatment programs (T. D. Cook & Campbell, 1979; Spector, 1981). Second, by selecting this data source for analyses, the study could only include research questions and develop hypotheses that would fit these data. Fortunately, a variety of indicators were available for analysis, many known from previous studies to be associated with alcohol use. Moreover, data were analyzed using robust statistical techniques which took advantage of the available indicators. Furthermore, secondary analyses of only quantitative data lack the richness of a mixed-methods approach. Perhaps, collecting qualitative responses on participant's perspectives and experiences would provide invaluable data for examining treatment effectiveness and should be considered by future studies.

An additional limitation of the study is selection bias, as the study only includes men, so the generalizability of findings to women is unknown. Since drinking is traditionally considered a "male phenomenon," and since drinking traditionally is prohibited among

females, very few studies have examined alcohol problems among Indian females. Moreover, it is important to note that most alcohol treatment programs in India have focused on male alcohol users only (Chavan et al., 2003; Khalsa, Khalsa, Khalsa, & Khalsa, 2008; Nattala et al., 2010; Pal, Yadav, Mehta, & Mohan, 2007; Raina, Chakraborty, Basit, Samarth, & Singh, 2001; Suresh Kumar & Thomas, 2007). Though some researchers argue that drinking among women is highly underestimated due to stigma-related underreporting (Sundaram, Mohan, Advani, Sharma, & Bajaj, 1984), the number of women users receiving alcohol treatment remains negligible. As a result, it is often neglected. Furthermore, Benegal et al. (2005) mentioned that "guilt-provoking" and "discriminatory" cultural attitudes towards female alcohol use in India often prevent this population from seeking professional help for their problems.

Implications for future research

Though the findings of the present study are significant and novel, the study as noted had several limitations. For future research, it will be essential to include female alcohol users and younger populations in studies examining alcohol use in India. Moreover, it will be important to evaluate the effectiveness of de-addiction camps (and other treatment programs) with these populations.

The camp treatment provides package care and includes a combination of several components. As the current study involved secondary analyses of the camp data it was only possible to select research questions and hypothesis that fit the available data. This limited the ability to evaluate the effectiveness of the individual treatment components. Though overall the camp treatment was found to be effective in this sample it is essential for treatment providers to understand the mechanism of individual treatments and their role in

the recovery process. This could help them to compile most effective treatment packages for the clients and maximize the available limited resources.

Another reason to examine the effect of individual treatment components is that each treatment modality has its own advantages and disadvantages among clients. As discussed by Vannicelli (1992), group psychotherapies have various advantages over individual counseling sessions. Such as relating with other group members could help clients to reduce the sense of isolation, increase hope, provide peer support, help them to understand and accept their flaws and create a sense of relief by knowing that they are not alone in this process. This could be beneficial during the recovery process. Group therapies could also encourage some clients to acquire information and learn about their conditions by observing how other substance abusers cope with problems like them which in turn might motivate clients to stay abstinent and deal with their issues.

Vannicelli (1992) also discussed how long-term interaction group therapies could help clients to form a relationship with other group members and treatment providers which is lacked in their family of origin and discuss the issues as they would with their siblings and parents. This could provide them an opportunity to understand their family members and their own role in the family in greater perspective but in new and healthier way. Group therapies providing treatment to clients with similar background and issues by one trained therapist can also reduce the cost of treatment to greater extent compared to individual counseling. Thus, group therapies could be beneficial option for those coming from poor financial background. In addition, confrontation with other group members and positive feedback received from them could help some clients to develop necessary skills to tackle

everyday life problems and increase the success of treatment by preventing harmful behaviors.

On the other hand, however, having mixed groups with clients at different stages of recovery, abstinent level and family as well as social backgrounds can provide a whole new set of challenges during the recovery process. Also, though the therapists have minimal participation in actual group discussions, they are ones who initiate and direct the course of discussion. Therefore, like any other treatment modality group therapy can result in poor treatment outcomes if administered by unskilled or untrained therapists. Moreover, social fear might prevent some clients from participating in group discussions and sharing their thoughts. For such clients, individual counseling might be a better choice of treatment than group therapies. In any case, researchers examining camp treatments should consider evaluating its components individually to better understand their mechanisms in the recovery process and to be able to choose the treatments that are in best interest of the client.

Finally, like most alcohol studies conducted in India, this study also included only those consuming alcohol legally. As a result, it is essential the future studies include those involved in illegal consumption of illegal alcohol such as homemade *arrack* or *toddy* who may also suffer greater negative consequences from drinking.

Significance to social work

This study highlights some important individual and environmental factors that are associated with alcohol use and treatment outcomes among Indian male alcohol users. By documenting the various components used in the camp treatment, and identifying key indicators of treatment outcomes, this study provides social workers with critical information that should be considered when interacting with patients and their families. A recent article

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(Prasad, 2009) about the rise of alcohol use in India mentioned a lack of trained

professionals, social workers or clinical psychologists who can provide after treatment

support to the recovering addicts. Thus, most doctors simply refer patients in India with

drinking problems to Alcohol Anonymous. Previous studies have shown that substance abuse

negatively impacts individual health, families and societies. Various negative consequences

of substance abuse are discussed in detail in the literature review section makes it a central

part of social work practices. Hence, even though social workers are not expected to be

specialist in substance abuse problems and treatment, they need to be well informed about

the various risks and protective factors associated with alcohol use and treatment outcomes

so that they feel confident enough, effectively treat, and ultimately prevent the recurrence of

alcohol problems among adults in India (Sarah Galvani). It is crucial for the Indian social

workers to understand that the trend of substance abuse is changing in India. Even though

currently most treatment programs focus on adult users, social workers need to involve

younger population and women when it comes to substance abuse and treatment. Similarly,

the study highlights that substance abuse is a multi-faceted problem and treatment success

depends on various biopsychosocial components. Indian social workers need to have

knowledge of these components and need to be trained to effectively engage families and

communities during the treatment process to grantee success.

As discussed in the limitations, the current study sample comprised of only male

alcohol abusers. In India, alcohol use is often considered as "male phenomenon". Such

cultural attitudes and stigma associated with women alcohol use, discourage them from

reporting substance use disorders and prevent from seeking professional help. Therefore, it is

essential that social workers receive adequate training in identifying alcohol use among

women and create awareness among this population by educating them about the negative

consequences of substance use disorders.

Conclusions

There has been a rapid growth in the prevalence of substance abuse in India in the

past few decades. Epidemiological studies have shown that though both Hindu and Muslim

religions generally encourage abstinent culture and prohibition is included as a directive

principle in Indian constitution, a free market economy, general socioeconomic growth,

growing disposable incomes, and favorable attitudes towards alcohol use have resulted

eventually in decline in age of initiation, and increased consumption of alcohol and drugs

among Indian men and women in recent years. This has resulted in several substances use

related problems ranging from individual consequences such as higher rates of alcohol

dependence and HIV/AIDS, to social consequences such as domestic violence, road traffic

injuries, suicidal attempts, financial burden on families and poverty. Despite the increasing

need, however, data on alcohol treatment programs have been very limited.

Currently, treatment for alcohol/drug problems across the country is offered mostly

by the Government of India via public mental health institutions, psychiatric departments of

government hospitals, private psychiatric clinics and substance abuse treatment

centers. Since a large population in India lives in rural and underserved areas, attempt is

made to provide services to this population locally rather than having them travel to urban

areas. However, like elsewhere the rural communities in India share the deficits in 'financial,

physical and human capital' and the rural health centers often suffer from shortage of doctors

and drugs, absenteeism, inadequate referral services, spread of communicable diseases,

poverty, and illiteracy (Chakradhar, 2009). To address these issues, a unique approach,

known as rural camps, was adopted by T.T. Ranganathan clinical research and de-addiction

center during 1980s. These rural camps adopted a concept of "community-based rehabilitation" and provided treatment locally making use of the strengths typically unique to rural communities, i.e., face-to-face contacts, community cooperation, community involvement and willingness to intervene in crises involving others in the community (Chakradhar, 2009). Rural camps first identify a "host organization," such as local schools, churches, and religious organizations that encourages the recruitment of patients requiring treatment and also provide local resources. The actual treatment includes detoxification with the help of Disulfiram, management of symptoms by local physicians and a 15-day inpatient program involving individual counseling, group therapies, and supportive programs for family members, prayer and educative sessions as well as monthly follow-ups.

The current study evaluated the predictors of alcohol use and effectiveness of this camp treatment among adult male alcohol users from southern India. Results revealed that early age of initiation and lower tobacco use was associated with higher alcohol use in the study sample. Nearly 68% of the study sample was found to maintain abstinent at the end of 12-month follow-up. Lesser number of adverse childhood events and family support was found to significantly impact the period of sobriety in the study sample. This is the first study to explore the predictors of treatment outcome among adult male alcohol users participating in treatment camps. By exploring these factors, we gain an in-depth understanding of the etiology and treatment process of de-addiction camps. Thus, the findings of this study have important practice and policy implication especially considering the limited research documenting treatment outcome among adult alcohol users in India.

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