

1.0 Introduction

Substance abuse, the physically hazardous uses of various psychoactive drugs leads to spectrums of bio-psychosocial morbidities, social instability, disability, occupational crisis, and ultimate health care burden. World Drug Report 2015, assessed that a sum of 246 million individuals, or 1 out of 20 individuals between the ages of 15 and 64 years, utilized an illicit drugs in 2013 and around 187,100 drugs related demises in 2013 (United Nations Office on Drugs and Crime, 2015). Worldwide situation anticipated, 4.9% of the world's adult population (240 million individuals) experience the ill effects of substance use disorder, causing an expected 257 incapacity balanced life years lost per 100 000 population In Nepal, studies have shown a significant rise with 91,534 substance users in 2013, which is nearly of double of that 46,309 in 2007 (Government of Nepal, 2013). The upsurge may be due to the government policy (Timsinha, Kar, & Agrawal, 2011), society, and the family tolerance (Shrestha, 1992) toward substance use.

The relapse rate with current treatment modality has shown 60% to 90% within the first year (Brownell, Marlatt, Lichtenstein, & Wilson, 1986; Maisto, Connors, & Zywiak, 2000; Miller & Wilbourne, 2002). Further, within 3 months 50% of patients experience the relapse (Guardia et al., 2002). Intra personal and interpersonal situations contribute significantly to relapse (Ramo & Brown, 2008). There is significant evidence that initial and adult stressful life events (Cadet, 2016), sleep disturbances (Conroy & Arnedt, 2014; Roehrs & Roth, 2015), lack of self-control (Wills, Ainette, Stoolmiller, Gibbons, & Shinar, 2008), and the comorbidity of depression and anxiety (Compton, Thomas, Stinson, & Grant, 2007; Davis, Uezato, Newell, & Frazier, 2008), are risk features for

the advance of substance use and serve as cues that trigger relapses. The psychomotor functions are tasks that essentially give prominence to timing, accuracy, coordination, steadiness, and strength with less or negligible cognitive demands (Ackerman, 1988; Chaiken, Kyllonen, & Tirre, 2000). Further, the deleterious effect of motor functions is more significant than cognitive impairments in substance abuse (Sullivan, Rosenbloom, & Pfefferbaum, 2000). Relapse of recovering substance abuser is predicated on motor functions obtained at the end of treatment (Parsons, 1998). Furthermore, numerous data has revealed that lack of inhibitory control (Domínguez-Salas, Díaz-Batanero, Lozano-Rojas, & Verdejo-García, 2016), and higher trait impulsivity (Verdejo-García, Lawrence, & Clark, 2008), contributes to the progress and relapse of the disorder. Cognitive impairments are highly prevalent in persons seeking treatment for substance use disorders (SUDs) (Bechara & Martin, 2004; Kübler, Murphy, & Garavan, 2005; Smith, Mattick, Jamadar, & Iredale, 2014). Substance dependence induces cognitive impairments that mainly affects the abilities of inhibition (Smith, Mattick, Jamadar, & Iredale, 2014), coordination of storage, and manipulation of information (Bechara & Martin, 2004), and visuospatial functions (Kübler, Murphy, & Garavan, 2005).

1.1 Yoga and substance abuse

Yoga based intervention as a promising complementary therapy for treating and preventing addictive behaviors (Khanna & Greeson, 2013). Yoga treatment of opiate dependence indicated, significant improvement in psychological, physical and quality of life as compared to treatment as usual group (Anju, Anita, Raka, Deepak, & Vedamurthachar, 2015). A recent study evaluated the long term efficacy of MBRP compared with cognitive-behavioral relapse prevention and treatment as usual. The

report showed a lower risk of relapse to substance use and significantly decreased heavy drinking during 12-month follow up period in the MBRP group in the intervention group compared to the other two group (Bowen et al., 2014). Promote spiritual way of lifestyle has demonstrated adequacy in treating of substance mishandle (Khalsa, Khalsa, Khalsa, & Khalsa, 2008). Yoga can lead to significant symptomatic improvements in psychiatric disorders, with changes in neurological pathways (Varambally & Gangadhar, 2012). Transcendental Meditation delivered generous and profoundly critical reductions in smoking, alcohol consumption, and illicit drug (Alexander, Robinson, & Rainforth, 2010). *Vipassana* Meditation participants showed decreases in alcohol-related problems and psychiatric symptoms as well as increases in positive psychosocial outcomes (Bowen et al., 2006).

1.2 Need of the study

Despite the demonstrated efficacy of different treatments, SUDs are characterized by chronic vulnerability to relapse after detoxification. Results indicate that abstinence in the behavioral intervention process appear to depend on cognitive abilities. Further, a recent study reported a significant dearth of neural motor inhibition, which correlates with altered inhibitory control in substance abusers, which intern emphasized the motor function as a new biomarker (Quoilin, Wilhelm, Maurage, Detimary, & Duque, 2018).

As highlighted previously, substance abuse is associated with significant psychological disturbance. Yoga is an ancient system of philosophy and lifestyle management technique, which help to achieve bio-psychosocial and spiritual homeostasis (Vivekananda, 2005). Yoga, a system of ethical, psychological, and physical practices, has shown encouraging results in the management of addictive behaviour (Davis,

Uezato, Newell, & Frazier, 2008). Initial efficacy was supported by significantly lower rates of substance use (Bowen et al., 2009), over the 4-month and a significant reduction in the risk of relapse to substance use and heavy drinking in the 6-month follow-up. Further, previous findings have shown augmentation of motor functions following yoga and physical exercise-based intervention (Friese, Messner, & Schaffner, 2012; Govindaraj, Karmani, Varambally, & Gangadhar, 2016; Oaten & Cheng, 2006). Prior research has shown enhancement of cognitive functions in healthy and elderly population following yoga-based intervention (Bowen et al., 2014). Hence, current study explored the effects of add-on yoga-based intervention and physical exercise on the performance of 4 commonly used cognitive tests evaluating working memory and executive function: Stroop test, digits forward, digits backward, and the cancellation task in addition to Treatment As Usual (TAU). Further, fine motor speed (Finger Tapping Task), Dexterity (O'Connor Tweezer Dexterity Test), and arm-hand steadiness (Mirror Star Tracing Test) were assessed. Furthermore, self-control, mindfulness, depression, anxiety, and sleep function were measured.

1.3 Brief overview of the study

This study is presented in eight chapters. This first chapter provided and need for this study. The second chapter includes a scriptural review of ancient *Ayurveda* texts and scriptures pertaining to sign symptoms, use, merits and demerits and cause of alcoholism The third chapter includes a detailed review of the literature pertained to yoga physical exercise and substance use. The fourth chapter presents the aims, objectives and research questions along with hypotheses. Additionally, definitions of variables are provided. The fifth chapter presents methodology, ethical consideration,

design, trial profile, interventions data analyses and outcome measures. The sixth chapter presents the result of the study. The seventh chapter presents an overall discussion. Finally, the eight chapter presents summary and conclusion with strength, limitation, implication and suggestions for future studies.