**CHAPTER ONE**

**INTRODUCTION**

* 1. **Introduction**

Quality of life is a comprehensive concept, which has often been applied in health care research particularly in the fields of disability studies and mental health care.

In several studies it was found that quality of life is an important indicator for the impact of treatment, the need for health care, the evaluation of interventions and for the cost benefit analysis. Defined as individuals perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns; quality of life is a broad ranging concept, incorporating in a complex way the person’s physical health, psychological state, level of independence, social relations, personal beliefs, and relationship to the environment (THE WHOQOL GROUP 1998).

Substance use is one of the major public health issues throughout the world. It is not only impairing public health, but also corrupting institutions, retarding socio-economic development, and threatening political stability and, in some cases, impacting state security. An estimated around 5 percent of the global adult population aged 15-64 years, used drugs at least once in 2015. Even more worrisome is the fact that about 0.6 percent of the global adult population, suffer from drug use disorders (United Nations Office on Drugs and Crime 2017).

Globally, United Nations Office on Drugs and Crime (UNODC) estimates that there were 190,900 drug-related deaths in 2015. People who inject drugs (PWID) face some of the most severe health consequences associated with drug use. Almost 12 million people worldwide inject drugs, of whom one in eight are living with HIV and more than half are living with hepatitis C (United Nations Office on Drugs and Crime 2017). Bangladesh is situated in the central point between the “golden triangle” (*Myanmar, Thailand and Laos*) and the “golden crescent” (*Pakistan, Afghanistan and Iran*) in terms of geographical location. It is also surrounded by the major drug producing countries of Asia (Rahaman 2014) making Bangladeshis high chances of becoming addict by substance.

National Institute of Mental Health(NIMH), Dhaka in collaboration with World Health Organization (WHO) conducted a multi-centric community based study during 2003-2005 which revealed that 0.63% of the adult population (18 years and above) in Bangladesh had substance dependence (Firoz et al. 2006).

According to a non-government organization “Green Sylhet ” there are more than 5,000 men and women drug addicts in the district including in the city. There are more than 10 rehabilitation centers in Sylhet region. Maximum patients who are taking the treatment in these rehabilitation centers are16 to 40 years age (Ahad, Chowdhury, and Islam 2017)*.*

According to the Diagnostic and Statistical Manual of Mental Disorder, fifth edition (DSM-5), the abuse able drugs are divided into following categories; Alcohol, Cannabis, Hallucinogens, Inhalant, Opioid, Sedatives/Hypnotic/Anxiolytic, Stimulants, Tobacco and Others (American Psychiatric Association 2013).

The major illicit substances available in Bangladesh are-

* Opium (*Heroin, Pethedine, Cocaine*)
* Cannabis (*Ganja, Chorosh, Bhang, Hashish*)
* Stimulant (*Yaba, Ectasy, Viagra*)
* Sleeping pill (*Tranquilizer, Diazepam) and*
* Cough syrup (*Phensidyl, Dexpotent*) etc. (Department of Narcotics Control 2014) (Department of Narcotics Control 2014).

Opium, cannabis and alcohol existed all through Mughal and pre-British period, but it no how affected the main stream of the society. Drug as a problem emerged mainly during mid-eighties in association with changes in global drug scenario. Though traditional drugs cannabis and alcohol have been prevailing yet, opium has been replaced by new drugs Heroin, Phensydil, Injecting drugs, Yaba and Glue respectively with the passage of time for last three decades. Drugs once concentrated in densely populated urban societies of big cities are now spreading over rural areas. Drugs have been shifted from upper to middle and lower middle class of population. Less educated and the youth are the major victim of drugs in Bangladesh. Women and children are also becoming victim of trafficking, peddling and consuming drugs (Department of Narcotics Control 2014).

In Sylhet, highest 95.24% are addicted to cannabis as a principal drug and second highest (61.90 %) involved in Yaba addiction. Around 50% of the drug addicts involved in heroin addiction, 47.62% addicted in alcohol, 42.33% addicted in Phensydil, 19.05% drug addicts regularly take pethidine/morphine injection. Cocaine and opium were taken by 7.14% and 2.38% of the drug addicts respectively (Ahad, Chowdhury, and Islam 2017)*.*

Substance use disorder is a cluster of cognitive, behavioral, and physiological symptoms indicating that the individual continues using the substance despite significant substance-related problems. For diagnosis of substance use disorder, DSM-5 denotes impaired control, social impairment, risky use, and pharmacological criteria(American Psychiatric Association 2013). Most substances of abuse directly or indirectly target the brain’s reward system by flooding the circuit with dopamine which is related to emotion and feelings of pleasure. When activated at normal levels, this system rewards our natural behaviors. Over stimulating the system with drugs, however, produces euphoric effects, which strongly reinforce the behavior of drug use—teaching the user to repeat it (Erickson 2009).

Major risk factors responsible for substance abuse are family disorganization, parental neglect, parent-child conflict, loss of spouse, strife, indiscipline, isolation, lack of emotional support, rejection of love, over protection, unemployment, repeated failure and personality maladjustment, easy availability of drugs (Mn et al. 2013). It has already proven that abuse of drugs has a wide range of adverse effects on human civilization. Drugs have the capacity to alter mood, perception, cognition and behavior and therefore have the potential to influence, either positively or negatively, quality of life (Fischer 2015).

There are many instruments to measure the quality of life among them

* The abbreviated World Health Organization Quality of Life Scale (WHOQOL-BREF),
* The 36-Item Short Form Health Survey (SF-36), and
* The Duke Health Profile are critiqued.

All address physical, mental, and social domains, while the WHOQOL-BREF also addresses environment (Hand 2016). The World Health Organization Quality of Life (WHOQOL) project was initiated in 1991. It comprises 26 items, which measure the following broad domains: physical health, psychological health, social relationships, and environment. The four domain scores denote an individual’s perception of quality of life in each particular domain. Higher domain scores means higher quality of life (The WHOQOL Group 1996). It is reliable (total cronbach’s α score 0.89), valid (total discriminant validity 0.23) and responsive (Tsutsumi et al. 2006).

In a study in America done by Morgan et al. (2003) it was found that injectable drug users were suffering more health related problems than non-injectable drug user. In Taiwan a similar study was done which was observed that mean scores of physical health, psychological, social relationships and environmental domains of quality of life of substance use disorder patients were 14.14±2.62, 12.92±2.44, 13.79±1.90 and 13.59±1.92 respectively (Hwang et al. 2003).

A similar study done in Dhaka which revealed that quality of life was low in all four domains (mean score of physical health domain was 7.39±2.53, psychological domain was 8.20±2.21, social relationship domain was 7.46±2.99 and environmental domain was 9.81±3.05) of substance use disorder patients. That study also found that quality of life was poor among injectable drug user than non-injectable drug user (Rahman PC)

**1.2 Rationale**

Substance abuse is an alarming threat in Bangladesh. It is a chronic relapsing behavioral problem that is difficult to cure. Assessments of the impact of substance use on quality of life (QoL) are important for decisions about how aggressively the problematic behavior should be treated, assessing the health needs of patients, and allocating resources. It is also an important prognostic variable for the evaluation of the effects and outcome of treatment for substance abuse.

The study regarding quality of life of substance use disorder patients in Bangladesh is limited therefore, it is worth the endeavor to investigate the association of substance dependency and quality of life to explore and to have better understanding of this aspects and which can also be useful for comprehensive management of this population especially in Sylhet region.

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* 1. **Research Question**

What are the overall impacts of substance use on the quality of life of substance use disorder patients?

**1.4 Hypothesis**

Substance use significantly impacts the quality of life of substance use disorder patients.

* 1. **Aims and Objectives**

**General objective:**

To assess the quality of life among the substance use disorder patients.

**Specific objectives:**

1. To find out the any possible relationship between socio-demographic factors with the substance use disorder patients.
2. To find out the relationship between various type of substance use and the quality of life.
3. To find out the relationship between routes of substance use and the quality of life.

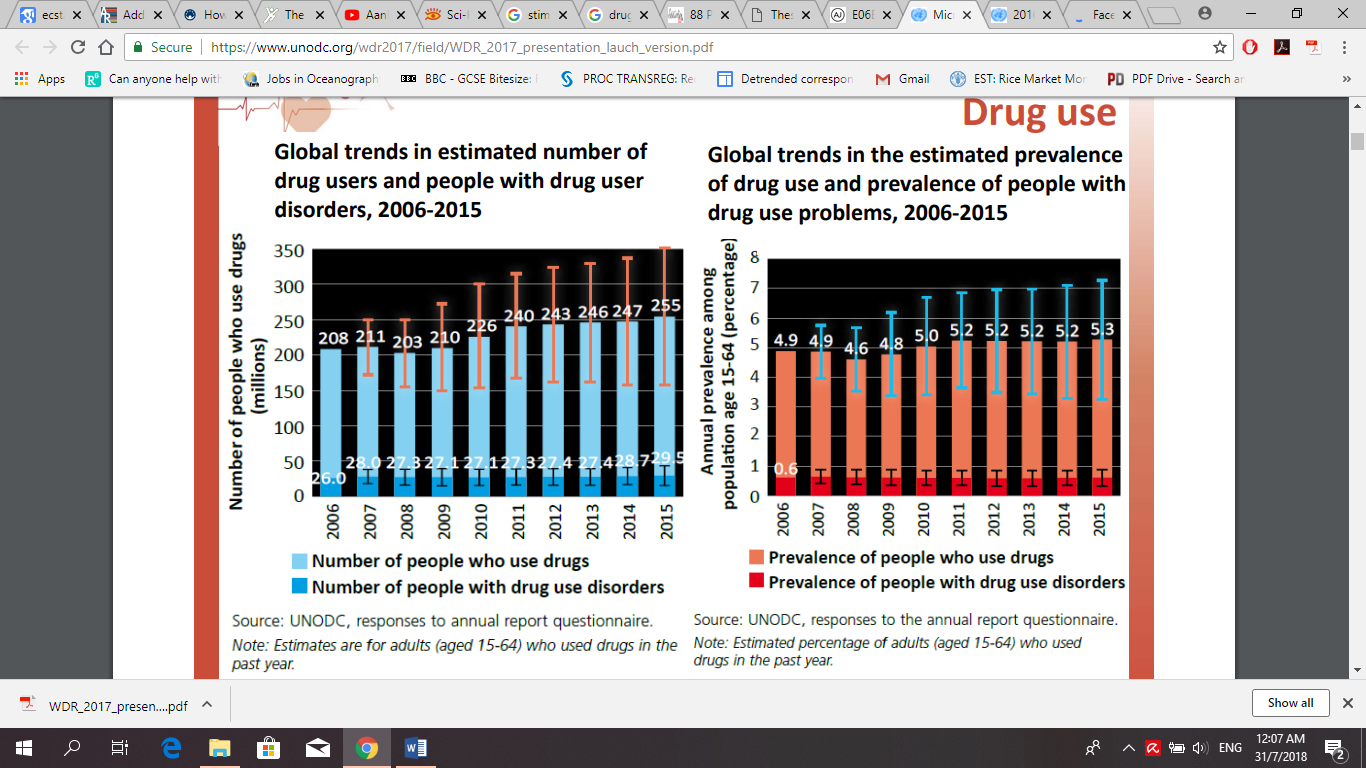
**CHAPTER TWO**

**LITERATURE REVIEW**

**2.1 Background**

Addiction was historically viewed as a disease of “weak personality” and was not systematically addressed by the scientific and medical communities until the latter half of the 20th century. Addictions are now commonly accepted as diseases of the brain caused by the impact of the drug itself on the brain (direct effects and neuroadaptations) and modified by various environmental factors. These factors include epigenetic changes, addict mind set, and social influences, including peer pressure, family environment, and especially, response to stress and stressors (Kreek et al. 2012). Substance use disorder is a cluster of cognitive, behavioural, and physiological symptoms indicating that the individual continues using the substance despite significant substance-related problems (American Psychiatric Association 2013).

Worldwide, UNODC estimated 255 million drug users and 29.5 million people with drug user disorders as at 2015. Situated in the central point between the “the golden triangle” (*Myanmar, Thailand and Laos*) and the “golden crescent” (*Pakistan, Afghanistan and Iran*), Bangladesh is surrounded by major drug producing countries, increasing the chances of substance addiction among Bangladeshis (Rahaman 2014). National Institute of Mental Health(NIMH), Dhaka in collaboration with World Health Organization (WHO) conducted a multi-centric community based study during 2003-2005 which revealed that 0.63% of the adult population (18 years and above) in Bangladesh had substance dependence (Firoz et al. 2006).



**Figure 2.1:** Global trends in estimated number people with drug disorder and prevalence of people with drug use problem, 2006-2015

Source: UNODC (2015)

**2.2 Concept of Quality of Life**

Quality of life is defined as individuals perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns; it is a broad ranging concept, incorporating in a complex way the persons’ physical health, psychological state, level of independence, social relations, personal beliefs, and relationship to salient features of the environment (THE WHOQOL GROUP 1998).

For more than three decades, the field of quality of life measurement has been evolving as a formal discipline with structured theoretical foundations and specific methodology (Lohr 2002). Over this time, quality of life has become increasingly recognized as an important outcome measure in treatment studies and service evaluation (Wong, Cheung and Chen 2005). The objective of evaluation of quality of life is to measure the interventions, adverse effects of treatment and the impact of the disease process and this evaluation is widely used in clinical trials and in observational studies of health and disease (Globe, Hays and Cunningham 1999)

Most researchers agree that QOL is a multi-dimensional construct. It seems to involve a complex interaction of individual (age, sex, socio-economic status, employment) social (children, relationships, and activities), health and spiritual domains. Being a multi-dimensional construct, QOL assessments appear to transcend singular domains. Arguably then the QOL experienced by drug users is likely to represent more than the effects or consequences of frequency and/or quantity of the drugs used (Fischer 2015).

QOL assessments also tend to be dynamic, that is they may change over time and in response to different life events. Across the life-course individuals tend to alter their expectations of what constitutes. For example subjective well-being appears to take on a ‘u’ shape across the life course. These changes in QOL seem to occur because the value individuals place upon what is important to them changes with time and context. These adjustments seem likely to be influenced by a combination of circumstance, coping methods and expectations (Fischer 2015).

McCall (1975), and others point out that even though the phrase "quality of life" has been in use since 1964 a consensually agreed upon definition still proves to be elusive. The definition may include such constructs as subjective well-being which includes happiness, life satisfaction, and positive affect (Diener 1984).

In 1947, the world health organization (WHO) expanded its definition of health beyond the “absence of disease and infirmity,” to include the “state of physical mental and social being.” This milestone change in connotation elevated the study of health related quality of life to an accepted endpoint for clinical studies and promulgated investigator interest(McSweeny and Creer 1995)

Since its inception, assessment of quality of life has remained controversial, mainly due to ambiguity in its definition and the difficulties with the objective assessment of subjective phenomenon. The variability in the concept of QoL can be seen by several different definitions published in the literature. Calman defined the quality of life as the gap between the patients expectations and achievements(Calman 1984)*.* Ware concluded that quality of life should measure both the full spectrum of health states ranging from diseases to well-being(E. Ware Jr. 1987)*.* Torrance suggested that quality of life is measured at each point in time between birth and death, suggesting that is an all-inclusive concept that incorporates all factors that affect the individual(Torrance 1987)*.* Kaplan and colleagues limit their assessment of health related quality of life to three functions, namely: mobility, physical activity and social activity(B. Sadok, V. Sadok 2015)*.* This wide variation in definition is reflected in the diversity of assessments provided by available quality of life instruments.

**2.3 Quality of Life and Substance Use Disorder**

Substance use disorder is one of the major public health issues throughout the world. It is not only impairing public health, but also corrupting institutions, retarding socio-economic development, and threatening political stability and, in some cases, impacting state security. Most substances of abuse directly or indirectly target the brain’s reward system by flooding the circuit with dopamine which is related to emotion and feelings of pleasure. When activated at normal levels, this system rewards our natural behaviours. Over stimulating the system with drugs, however, produces euphoric effects, which strongly reinforce the behaviour of drug use—teaching the user to repeat it (Erickson 2009).

It has already proven that abuse of drugs has a wide range of adverse effects on human civilization. Drugs have the capacity to alter mood, perception, cognition and behaviour and therefore have the potential to influence, either positively or negatively, quality of life (Fischer 2015). Major risk factors responsible for substance abuse are family disorganization, parental neglect, parent-child conflict, loss of spouse strife, indiscipline, isolation, lack of emotional support, rejection of love, over protection, unemployment, repeated failure and personality maladjustment, easy availability of drugs (Shazzad et al. 2014).

Quality of life concept mirrors the subjective perception of a drug-addicted patient’s well-being and functioning, related to physical, emotional and social aspects as well as everyday lifestyles (Bullinger 1991) and is also becoming an important clinical and research outcome within the drug and alcohol abuse context. The subjective aspect of quality of life, especially in the field of mental health, has attained importance in the measurement of therapeutic results, which helped to progressively shift the clinical focus from a cure to enhancing quality of life (Ruggeri et al. 2002). It is important to establish a model of longitudinal monitoring, which able to improve the communication between the patient and healthcare professional, considering that substance dependence is a chronic disorder (Lasalvia et al. 2005). In addition to the well-known impairment of general health standards, substance abuse results in unstable and unsafe life patterns in a significant proportion of users as well as impaired interpersonal, social and professional skills. In the field of substance abuse, the concept of quality of life has been applied in terms of functioning, well-being and life satisfaction (Torrens et al. 1999; Giacomuzzi et al. 2003). Nevertheless, objective of evaluating quality among drug-dependent individuals should focus on how the drug-dependent individuals experience their daily life, not only to evaluate patients about the presence or absence of symptoms or adverse reaction to treatment (Morales-Manrique at al., 2006; Revicki et al. 2000).

Previous researches had linked the lower evaluation scores of quality of life and substance dependency. (Vederhus, Pripp, and Clausen 2016) compared the quality of life in patients admitted to a general hospital with those admitted to a detoxification unit for the treatment of substance use disorder (SUD). All patients completed a generic quality of life questionnaire at inclusion, and the SUD sample also completed it at the six-month follow-up. SUD patients experienced comparably low physical quality of life and had significantly lower psychological, social, and existential quality of life domain scores when compared with the somatic sample. Mental distress and having a SUD were the major factors explaining variations in quality of life, with both influencing quality of life negatively.

In several studies it was found that QoL is consistently poorer among active substance dependent patients and treatment seekers than among cohorts without dependence or chronic psychiatric condition (Foster et al, 1999; Smith & Larson, 2003). This is consistent across comparison of alcohol, dependent samples with chronic health or mental health conditions, cancer, diabetes and heart failure (Foster, Peters, and Marshall 2000)

Smith and Larson (2003) compared quality of life of 570 randomly selected adult substance abusers in six detoxification canters and seven outpatient facilities in Massachusetts to quality of life of chronic diseases patients. Two quality of life instruments--the Multidimensional Index of Life Quality (MILQ) and the SF-12--were used to measure quality of life. Substance use problems were measured by the Addiction Severity Index Drug and Alcohol composite scores. Quality of life scores were compared to those for patients with other chronic diseases. The results showed that substance abusers clients reported significantly lower quality of life scores than patients about to undergo heart surgery on seven of the nine MILQ domains as well as the MILQ QOL summary index. Substance abuser clients also had much lower mean scores than the general population on both the SF-12's Mental Health (ES = -1.80) and Physical Health (ES = -0.58) component scales. The results of this study suggest that the physical functioning of adult substance abusers is similar to the levels for patients diagnosed with other serious chronic diseases, but that mental functioning is much lower.

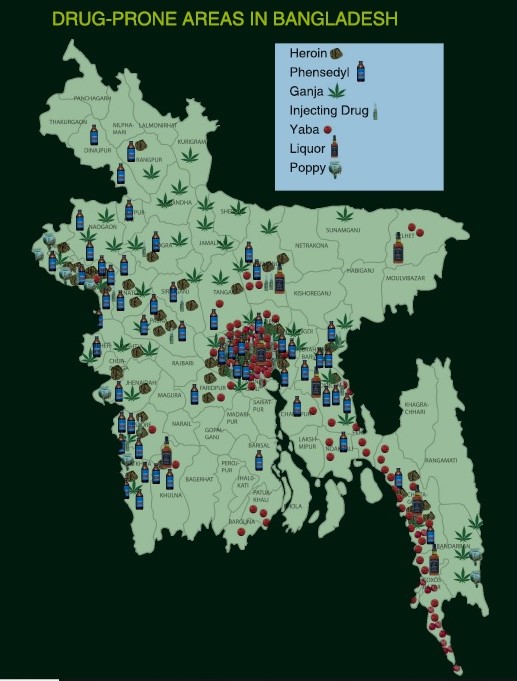
Bizzarri et al (2005) conducted a research comparing the scores of physical health, psychological, social relationship and environment domain using *WHOQOL-BREF)* between a healthy patients and substance dependents group (opiates dependents in this case), and the results showed that healthy patients scored higher DOM1 by 30%, DOM2 by 34% and DOM3 by 27%. However, the scores between the two groups were not significantly different for DOM4 where healthy patients scored 59.18 whereas substance dependents group scored 52.99.

In Taiwan a similar study was done which was observed that mean scores of physical health, psychological, social relationships and environmental domains of quality of life of substance dependent patients were 14.14±2.62, 12.92±2.44, 13.79±1.90 and 13.59±1.92 respectively (Hwang, H et al 2003). In a study in America done by Morgan et al (2003) it was found that injectable drug users were suffering more health related problems than non-injectable drug user.

**2.4 Major illicit substances in Bangladesh**

This section provides information on major illicit substances in Bangladesh and their effects on physical and mental health.

According to the Diagnostic and Statistical Manual of Mental Disorder, fifth edition (DSM-5), the abuse able drugs are divided into following categories; Alcohol, Cannabis, Hallucinogens, Inhalant, Opioid, Sedatives/Hypnotic/Anxiolytic, Stimulants, Tobacco and Others (American Psychiatric Association 2013).



**Figure 2.2:** Drug-prone areas in Bangladesh

Source: Department of Narcotics Control (2014)

The major illicit substances available in Bangladesh are-

* Opium (*Heroin, Pethedine, Cocaine*)
* Cannabis (*Ganja, Chorosh, Bhang, Hashish*)
* Stimulant (*Yaba, Ectasy, Viagra*)
* Sleeping pill (*Tranquilizer, Diazepam) and*
* Cough syrup (*Phensidyl, Dexpotent*) etc. (Department of Narcotics Control 2014) (Department of Narcotics Control 2014).
* **Opium (Heroin, Pethidine, Cocaine)**

Opium is a narcotic analgesic drug which is originally obtained from the unripe seed pods of the opium poppy. Opium is used as the raw material for the synthesis of some medications such as morphine, noscapine, papaverine and codeine which contains 8~17%, 1~10%, 0.5~1.5% and 0.7~5% of opium, respectively. Although opioids are highly effective for the treatment of pain, they are also known to be intensely addictive (Williams, Christie, and Manzoni 2001).

Despite the increased use of a wide range of psychoactive drugs, the use of opioids, in particular—heroin, other opiates, and prescription opioids—continues to be a major drug problem globally (UNODC 2013). The United Nations World Drug Report 2013 estimated that approximately 16.5 million people worldwide aged 15 or older used heroin or opium. Of these users, approximately 23% are estimated to develop opioid dependence (Anthony, Warner and Kessler 1994)



**Figure 2.3:** Opium (Heroin, Pethidine, Cocaine)

Source: city news1130 (2016)

It has been well documented that opioid addiction is associated with high rates of mortality, morbidity, and other adverse consequences (Hser et al. 2001). A review by Degenhardt et al. (2010) revealed that opioid dependence is the biggest contributor to the global burden of disease that is attributable to illicit drug use and dependence.

Opioid addiction is the most studied drug use disorder, and numerous research findings have indicated that it is chronic and relapsing. Until recent years, heroin has been the drug predominantly used by most opioid addicts. Most long-term cohort studies on opioid addiction are consequently based on heroin addicts (Hser et al. 2015).

The opioid system consists of three G protein-coupled receptors, mu-, delta-, and kappa, which are stimulated by a family of endogenous opioid peptides. Heroin and prescription opioids, such as oxycodone or hydrocodone (e.g., OxyContin and Vicodin, respectively) act primarily as MOP-r (an opioid receptor system) agonists with relatively short duration of action, whereas cocaine (and other stimulants, e.g., methamphetamine) act primarily to increase synaptic dopamine by inhibition of dopamine reuptake or an increase in release. Activation in the dopaminergic mesocortico/mesolimbic and nigrostriatal systems, either directly in the case of cocaine or indirectly for heroin/prescription opioids or alcohol, appears to be a common neurobiological consequence of exposure to drugs of abuse (Kreek et al. 2012).

Intravenous use with non-sterile needles and syringes or other related equipment may lead to transmission of infections like HIV and hepatitis and the risk of contracting bacterial or fungal endocarditis. However, contrary to other countries where heroin is injected, in Bangladesh, heroin is mostly smoked within aluminium foil or cigarette paper (Shazzad et al. 2014).

Physical dependence can result from prolonged use of all opioids, resulting in withdrawal symptoms on cessation of use. It decreases kidney function (Dettmeyer et al., 2005) and skin abscesses, and direct injection more often leads to fatal outcome. A small percentage of heroin smokers, and occasionally IV users, may develop symptoms of toxic leukoencephalopathy (Hill, Cooper and Perry, 2000; Halloran, Ifthikharuddin and Samkoff, 2005; Offiah and Hall, 2008) where the symptoms include slurred speech and difficulty walking.

* **Cannabis (Ganja, Chorosh, Bhang, Hashish)**

Cannabis or marijuana is a natural product where the main psychoactive constituent of which is tetrahydrocannabinol (THC). The cannabis plant (*Cannabis sativa* L.) is broadly distributed and grows in temperate and tropical areas. Together with tobacco, alcohol and caffeine, it is one of the most widely consumed drugs throughout the world. Herbal cannabis consists of the dried flowering tops and leaves. Cannabis is almost always smoked, often mixed with tobacco. Almost all consumption of herbal cannabis and resin is of illicit material (EMCCDA 2018).



**Figure 2.4**: Cannabinoids

Source: Daily motion (2018)

The collective name given to the terpenes found in Cannabis is cannabinoids. Most of the naturally occurring cannabinoids have now been identified, and three are the most abundant—cannabidiol (CBD), tetrahydrocannabinol (THC), and cannabinol (CBN). Although many other materials have been found in this plant, the cannabinoids are unique to it and THC is the only one with appreciable mental affects. THC is believed to be largely, if not solely, responsible for the effects desired by those who use Cannabis socially. Virtually all the effects produced by smoking or eating some of the whole plant can be attained by using THC alone (Hollister 2001).

Regular marijuana smoking can contribute to emotional and other behaviourally defined mental health problems through degraded interpersonal relationships and arrested development. The mechanism for this seems to be a drug-induced perception of well-being and problem abatement that may not reflect reality and contributes to avoidance rather than coping with life situations (Bloom 2001).

* **Stimulant (Yaba, Ectasy, Viagra, Methamphetamine)**

As the name implies, these drugs stimulate the user. Stimulants are a class of [psychoactive drug](https://www.verywellmind.com/what-is-psychoactive-22500) that increase activity in the [brain](https://www.verywellmind.com/the-anatomy-of-the-brain-2794895) whereby these drugs can temporarily elevate alertness, mood and awareness. Some stimulant drugs are legal and widely used however, many stimulants can also be addicting. Stimulants share many commonalities, but each has unique properties and mechanisms of action.

An example of common stimulant Yaba, is a combination of methamphetamine and caffeine. Euphoria, anxiety, increased libido, alertness, concentration, increased energy, increased self-esteem, self-confidence, sociability, irritability, aggressiveness, psychosomatic disorders, psychomotor



**Figure 2.5:** Yaba pills

Source: [thedailystar.net](http://www.thedailystar.net) (2018)

agitation, dermatillomania, hair pulling, repetitive and obsessive behaviors, hallucinations, excessive feelings of power and invincibility, delusions of grandiosity, paranoia are all the psychological effects of methamphetamine (Shazzad et al. 2014)

Other than being highly addictive (Dark et al. 2008), long term use of stimulant such as Methamphetamine has a high association with depression and suicide as well as serious heart disease, amphetamine psychosis, anxiety, and violent behaviours (Shazzad et al. 2014). Although not directly neurotoxic, long term use of Methamphetamine can have neurotoxic side-effects and the usage is also associated with an increased risk of Parkinson's disease due to uncontrolled dopamine release (Cruickshank and Dyer 2009). Neurotoxicity due to long-term dopamine upregulation because of Methamphetamine abuse is believed to be responsible for causing persisting cognitive deficits, such as impaired attention, memory loss, and decreased executive function. Similar to the neurotoxic effects on the dopamine system, methamphetamine can also result in neurotoxicity to the serotonin system (Krasnova and Cadet 2009). Long-lasting psychosis resembling schizophrenia affect over 20% of methamphetamine addicts, even after quitting methamphetamine and the condition persists for longer than 6 months and is irreversible (Barr et al. 2006).

* **Sleeping pill (Tranquilizer, Diazepam)**

Around the world, sleeping pills are prescribed to decrease or eliminate anxiety, produce sedation, control certain types of seizures, induce and maintain sleep, and relax skeletal muscles. Benzodiazepines are present in most sleeping tablets (hypnotics), and can also be used as sedatives before surgical operations, as light anaesthetics during operations, and to lessen muscle spasms, such as occur with sports injuries. Some benzodiazepines can be used to treat some forms of epilepsy.



**Figure 2.6:** Sleeping pills

Source: Recovery Unplugged Encore (2018)

Benzodiazepines reacting with central nervous system and interact directly with proteins that form the benzodiazepine receptor which exist as part of a larger receptor complex. Neurotransmitter gamma-amino butyric acid (GABA) interacts with this complex and leads to the enhanced flow of chloride ions into neurons (Kardos 1993).

Much of the available evidence indicates that the action of benzodiazepines involves a facilitation of the effects of GABA and similarly acting substances on the GABA receptor complex, thus leading to an increased movement of chloride ions into nerve cells. Entry of chloride ions into neurons tends to diminish their responsiveness to stimulation by other nerve cells, and consequently substances that produce an increase in chloride flow into cells depress the activity of the central nervous system. This depressant effect becomes manifested as either sedation or sleep (Miller 2002).

Prescribed patients that increase the dose above recommended levels may become intoxicated, with slurred speech and incoordination. The abuse of benzodiazepines is common among people with alcohol problem. Intravenous (IV) injection of benzodiazepines and hypnotics has become an increasing problem and has led to controls on these drugs concerning manufacture and prescription in various countries, including the United States and the U.K. Some addicts abuse benzodiazepines alone; others combine it with heroin-type drugs. Injection of benzodiazepines can result in clotting of the veins besides carries the risk of getting infectious diseases from sharing dirty syringes, such as hepatitis and the human immunodeficiency virus (HIV or the AIDS virus) (Ladder 2001).

* **Cough syrup (Phensydil, Dexpotent) etc**.

Cough syrup such as Phensydil is banned in Bangladesh due to the alarming rate of consumption of Phensydil among youth in Bangladesh to get intoxicated. Phensydil, contain codeine, as one of the most active ingredients and typically derived from the more potent drug, morphine. Some regular codeine users consume it to reduce anxiety, and some simply find the substance’s effects pleasant. A clinical test of codeine found no antidepressant action, but people who use codeine for a long time tend to be depressed. Other than that, codeine can promote sleepiness, abdominal cramps, constipation, urinary retention, nausea, and breathing impairment (Miller 2002).



**Figure 2.7:** Phensydil

Source: India Legal Bureau (2018)

**2.5 ROUTES OF SUBSTANCE USE**

* **Smoking**

Smoking is one of the most common routes of drug administration, encapsulating tobacco, marijuana, opium, heroin, cocaine and various other substances. During the process of smoking, the smoke goes to the lungs and is then rapidly absorbed into the bloodstream. This makes it one of the fastest ways for someone to experience a high as the chemicals are transferred to the necessary bodily receptors in seconds. Smoking has several side effects which pose significant risks to the smoker’s health, regardless of the drug involved. The side effects include; heart disease, mouth, throat and lung cancer, heart attacks and strokes, chronic obstructive pulmonary disease (including emphysema and chronic bronchitis), high blood pressure (hypertension), bacterial pneumonia and other lung infections (Fischman 2001).

* **Nasal**

Drugs administration through nasal, or snorting of drugs (or insufflation) is conducted mostly by users of tobacco, cocaine, heroin, ecstasy and amphetamines. Around 30 to 60% of the snorted chemicals will enter the bloodstream through the mucus membrane in the nose. The rest is then swallowed and moves down to the stomach where it finally reaches the blood. In general, the high is experienced within about 15 minutes from the time of snorting. Health risks attributed to insufflating drugs include damage of the inside lining of the nostrils, damage of nasal cavity and even destroying the septum, the wall of cartilage between the two nostrils. Other than that, sharing bank notes, straws or pens to snort drugs can result in the spreading of infectious diseases such as [hepatitis C and HIV](http://www.nida.nih.gov/researchreports/cocaine/treatment.html) (Fischman 2001).

* **Swallowing/Oral Intake**

One of the simplest ways of taking drugs is through the mouth and allows the drugs to move onto the stomach where they are absorbed by the stomach lining and then enter the bloodstream. The most [common drugs](http://www.drugabuse.gov/DrugPages/DrugsofAbuse.html) to be taken in this way are alcohol, marijuana, opium, amphetamines, ecstasy, LSD and magic mushrooms. Swallowing is one of the [safest ways to take drugs](http://www.needle.co.nz/fastpage/fpengine.php/templateid/28) for several reasons. Firstly, the substance will be slowly absorbed through the stomach lining resulting in effects which are less extreme and therefore less dangerous. Secondly, an individual’s digestive system is designed to induce vomiting if that person ingests anything risky. There have, however, been cases of people [dying from swallowing cocaine](http://blogs.miaminewtimes.com/riptide/2010/07/man_dies_after_swallowing_coca.php), showing that there are still some dangers present with this particular route of administration (Fischman 2001).

* **Injections**

This route of administration is a recent development in the drug scene and involves a syringe full of an illicit substance being injected directly into the blood stream which can be done in three different ways; 1) Subcutaneous Injections: Directly into the soft tissue just beneath the skin 2) Intravenous Injections: Directly into a vein found under the surface of the skin 3) Intramuscular Injections: Directly into a muscle found deeper in the body (Fischman 2001).

Injection is the one of the most popular routes of administration as the full effects are felt [almost immediately](http://en.wikipedia.org/wiki/Drug_injection), typically within 3 to 5 seconds. Danger that it leads to include increased chance of infection due to contaminated needles or drugs, run the risk of spreading blood-borne diseases, such as HIV and hepatitis, scarring of the veins which caused by blunt syringes and may lead to the vein collapsing an arterial damage at the injection site, which can lead to hemorrhaging, distal ischemia, gangrene, endarteritis and thrombosis ([Des Jarlais et al., 2003](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3225003/#R9); [Kral, Bluthenthal, Erringer, Lorvick, & Edlin 1999](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3225003/" \l "R16); [Thomas et al. 1996](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3225003/#R29)). There is also an increased chance of addiction for those who take drugs via injections. This is because the heightened feelings that they experience may lead them to come back and repeat the action simply to relive the previous emotions.

However, among all the routes of substance, injection drug use (IDU) is proven to be of higher risk and had poorer health outcomes than non-IDUs. People who inject drugs (PWID) face some of the most severe health consequences associated with drug use. Almost 12 million people worldwide inject drugs, of whom one in eight (1.6 million) are living with HIV and more than half (6.1 million) are living with hepatitis C (WORLD DRUG REPORT 2017).

**2.6 Treatment Options**

Addictions are now commonly accepted as diseases of the brain caused by the impact of the drug itself on the brain (direct effects and neuroadaptations) and modified by various environmental factors. These factors include epigenetic changes, addict mindset, and social influences, including peer pressure, family environment, and especially, response to stress and stressors (Kreek et al. 2012). Pioneering studies in the 1960s and 1970s led to the development of methadone, the first (and still effective and widely used) treatment for the long-term management of addictions to heroin and other opiates (Dole, Nyswander and Kreek, 1966; Kreek, 2000; Kreek 1973). During the 1980s, efforts coalesced around the investigation and development of pharmacological treatments for other drugs of abuse, including alcohol and cocaine, though there are still no approved medications for the treatment of cocaine addiction.

Additionally, the presence of specific variants of multiple genes may enhance or decrease the vulnerability to developing specific addictions. These gene variants may function synergistically with genetic polymorphisms involved in common comorbid conditions, such as anxiety or depression, and stress responsivity. Addictions can also be comorbid with major infectious disorders, such as HIV/AIDS (Novick, Khan and Kreek 1986).

**CHAPTER 3**

**METHODOLOGY**

**3.1 Study design:**

Cross-sectional and comparative study

**3.2 Place of study:**

Study was conducted at the department of psychiatry, SOMCH, Sylhet.

**3.4 Duration of study:**

1st July, 2017 to 30th June, 2018

**3.5 Target population:**

Substance related disorder patients who attended for treatment to the department of psychiatry, SOMCH, Sylhet, RR Medical Hospital, Monorog Hospital and Shahjalal Mental Health & Research Center and apparently healthy persons attending with other patients who have no history substance abuse and biological relationship with cases.

**3.6 Study population:**

**Case:** Among target population who fulfil the inclusion criteria

**Control:** Age and sex matched apparently healthy persons attending with other patients who have no history substance abuse and biological relationship with cases.

**3.7 Sampling method:**

Purposive sampling

**3.8 Sample size:**

Sample size calculated by using Fruchure and Guilford formula considering by 5% precision level (marginal error) and over all prevalence (P)

[





*p=* 0.63%=0.0063

*q =* 1*-p =* 1-0.006=0.9937

*d =* marginal error considered as 5% (0.05).]

n = z2pq/d2

= (1.96)2 × 0.006 × 0.9937 / (.o5)2

=3.8416×0.0063×0.9937/0.0025

= 9.6198

According to this formula the required sample size was 10. For standard study, 50 sample was taken for each group.

**3.9 Enrollment criteria:**

**3.9.1. Inclusion criteria:**

**Case:**

1. Substance use disorder patients within the range of 18 years and above.
2. After adequate clinical improvement if Substance use disorder patients was in intoxicated or withdrawal state.

**Control:** Age and sex matched apparently healthy persons attending with other patients who have no history substance abuse and biological relationship with cases.

**3.9.2 Exclusion criteria:** (both case and control)

1. Those who refused to give consent
2. Patients who had co-morbid psychiatric disorders.
3. Patients those who were mute, stuporus and unable to communicate with the researcher/interviewer.
4. Patients had co-morbid known medical illness which have significant impact on quality of life of that patient.

**3.10 Variables:**

**3.10.1 Outcome variables:**

1. Physical health score
2. Psychological score
3. Social relationships score
4. Environment score

**3.10.2 Demographic variables:**

1. Age
2. Sex
3. Religion
4. Marital status
5. Habitat
6. Educational status
7. Occupation
8. Family income
9. Family history of psychiatry illness
10. Household composition
11. Monthly self-income
12. Age of onset of taking drugs
13. Types of starter drug
14. Types of drug/drugs currently use
15. Principal drug
16. Duration of substance abuse
17. Routes of substance use
18. Treatment received by substance abuse patients
19. Daily expense on drug
20. Hospital admission due to substance abuse

**3.11 Operational definition:**

**Drug/Substance**  refers to “any chemical substance which affects bodily function, mood, perception or consciousness which has potential for misuse and which may be harmful to the individual or the society (Kornblum, Julian, and Smith 2003). According to UNODC, **Illicit drugs** is used to describe drugs which are under international control (and which May or may not licit medical purposes) but which are produced, trafficked and/or consumed illicitly.

**Substance abuse** refers to the harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs.

**Substance use disorder** is a cluster of cognitive, behavioral, and physiological symptoms indicating that the individual continues using the substance despite significant substance-related problems (American Psychiatric Association 2013)

**Dependence syndrome** - a cluster of behavioural, cognitive, and physiological phenomena that develop after repeated substance use and that typically include a strong desire to take the drug, difficulties in controlling its use, persisting in its use despite harmful consequences, a higher priority given to drug use than to other activities and obligations, increased tolerance, and sometimes a physical withdrawal state (American Psychiatric Association 2013).

**Intoxication** refers to the clinically significant problematic behavioral or psychological changes (e.g., belligerence, mood lability, impaired judgment) which are attributable to the physiological effects of the substance on the central nervous system and develop during or shortly after use of the substance. The most common changes in intoxication involve disturbances of perception, wakefulness, attention, thinking, judgment, psychomotor behavior, and interpersonal behavior (American Psychiatric Association 2013).

**Tolerance** is a state in which, after repeated administration, a drug produces a decreased effect, or increasing doses are required to produce the same effect (Cowen, Harrison, and Burns 2012).

**Withdrawal** state refers to a group of symptoms and signs that occur when a drug is reduced or withdrawn, which last for a limited time. The nature of withdrawal state is related to the class of substance used (Cowen, Harrison, and Burns 2012).

**Quality of life** is defined as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns; it is a broad ranging concept, incorporating in a complex way the persons’ physical health, psychological state, level of independence, social relations, personal beliefs, and relationship to salient features of the environment (THE WHOQOL GROUP 1998).

**3.12 Research Instruments:**

1. **World Health Organization Quality of life Scale, brief version (WHOQOL BREF):** The WHOQOL-100 quality assessment was develop by the WHOQOL Group with fifteen international field centres simultaneously, in an attempt to develop a quality of life assessment that would be applicable cross culturally. Since the 100 items WHOQOL is too lengthy the WHOQOL-BREF was developed which has four domains (physical health, psychological health, social relationships, and environment). Domain scores are scaled in a positive direction (i.e. higher scores denote higher quality of life) (The WHOQOL Group, 1996). The WHOQOL-BREF is available in 19 different languages and also has been used at home to assess the quality of life in Obsessive Compulsive Disorder (OCD), Schizophrenia, Major Depressive Disorder and Substance Use Disorder.The scale has been translated in Bangla by using scientifically based method and reliability (Total cronbach’s α score 0.91) and validity (Total discriminant validity 86.64 ± 1.01) was tested in Bangla culture context (Tsutsumi et al. 2006).
2. **Diagnostic and Statistical Manual of Mental Disorder (DSM-5):** The American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM) is a classification of mental disorders with associated criteria designedto facilitate more reliable diagnoses of these disorders. With successive editionsover the past 60 years, it has become a standard reference for clinical practice in the mentalhealth field. Since its first publication in 1952, DSM has been reviewed and revised four times; the criteria in the last version, DSM-IV-TR, were first published in 1994. Since then, knowledge about psychiatric disorders, including substance use disorders, has advanced greatly. To take the advances into account, a new version, DSM-5, was published in 2013. It is important to emphasize that the current diagnostic criteria are the best available description of how mental disorders are expressed and can be recognized by trained clinicians. The criteria are concise and explicit and intended to facilitate an objective assessment of symptom presentations in a variety of clinical settings—inpatient, outpatient, partial hospital, consultation-liaison, clinical, private practice, and primary care—as well in general community epidemiological studies of mental disorders. DSM-5 is also a tool for collecting and communicating accurate public health statistics on mental disorder morbidity and mortality rates. The classification of disorders is harmonized with the World Health Organization's *International Classification of Diseases* (ICD), the official coding system used in the United States,so that the DSM criteria define disorders identified by ICD diagnostic names and codenumbers. In DSM-5, both ICD-9-CM and ICD-10-CM codes (the latter scheduled for adoptionin October 2014) are attached to the relevant disorders in the classification. **In DSM-5,** the categories of substance abuse and substance dependence have been eliminated and replaced with an overarching new category of substance use disorders—with the specific substance used defining the specific disorders. **DSM-5 Diagnostic Codes (ICD-10-CM)** for Substance Use Disorder is F.10 to F.18 (American Psychiatric Association 2013).
3. **Pre-designed structured questionnaire to identify the socio demographic characteristics:** The questionnaire was include socio demographic variables such as age, gender, educational level, marital status, occupation, monthly income, type of substance use, duration of substance use, routes of administration etc. of the patients. Researcher himself collected data by this questionnaire from the patients by face to face interview to avoid bias. During interview, investigator used English version of questionnaire which is shown in later.

**3.13 Procedure of the data collection:**

* A prior permission was taken from
* The Head of the department of psychiatry, SOMCH, Sylhet and
* The Director/Authority of non-government mental health related hospital include Sylhet Monorog Hospital, RR Medical Hospital, and Shahjalal Mental Health & Research Center.
* In addition, all official procedure was also be maintained.
* Patients with Substance Related Disorder were selected as sample from the place of study.
* Clinical diagnosis of Substance Use Disorder patients was done by investigator himself according to the DSM-5 and confirmed by consultant psychiatrist.
* Age and sex matched apparently healthy persons were evaluated by proper history taking for control of this study.
* The investigator collected data from both outdoor and indoor of psychiatry department of SOMCH, and also from Sylhet Monorog Hospital, RR Medical Hospital, and Shahjalal Mental Health & Research Center.
* Patients and control was informed about the purpose of the study and ethical issues.
* Then, after taking the written consent, data collection procedure was initiated by the investigator himself through one to one interview.
* Initially researcher had approached fifty five patients with substance use disorder who were chosen purposively, out of which two did not give their consent, and three were excluded due to co-morbid psychiatric disorder.
* Researcher collected data from 50 age, sex matched control in first attempt where no one was excluded due to exclusion criteria.
* The socio-demographic information was documented by using the structured questionnaire to identify the socio-demographic characteristics and it was collected from the patients and also from their caregiver if needed.
* Then Bengali and English version of World Health Organization Quality of Life Scale-brief version (WHOQOL-BREF) was applied to evaluate quality of life among patients with Substance Use Disorder.

**3.14 Flow Chart:**

Final Submission to the Authority

Report writing

Target population

Study population

Case (n=50)

Control (n= 50)

Inclusion and exclusion criteria

Assessment of-

* Socio-demographic & relevant informations
* Personality disorder

Assessment of-

* Socio-demographic & relevant informations
* Personality disorder

Data recording

Data recording

Data Analysis

Data Analysis

Result

Result

Comparison

**3.15 Statistical analysis**

* Data was processed manually and analyzed with the help of statistical package for social science (SPSS) version 22.
* General characteristics of the patients was presented in terms of percentage, mean and standard deviation.
* Comparison and association was tested using the independent t-test, Chi Square test, Least Significant Difference (LSD), generalized linear model, and others.
* A *p* value of ≤0.05 was considered statistically significant.

**3.16 Results**

Results was tabulated and presented by appropriate method i.e. frequency table, bar chart and pie diagram.

**3.17 Discussion and conclusion:**

* Relevant theory and scientific basis was discussed.
* Constraints of the study, limitation and recommendation was highlighted.
* Results in this study was compared with other relevant studies.
* Causes of any discrimination with other study was highlighted.
* Conclusion was made on the basis of the findings.

**3.18 Recommendation:**

Recommendation was done on the basis of findings. The preliminary findings was shared with respective departments.

**3.19 Ethical consideration:**

* The study protocol was submitted for the institutional Ethical Review Committee of Sylhet MAG Osmani Medical College, Sylhet.
* The purpose and methods, confidentiality of the interviews, risk and benefits of the participating in the study, their rights to participate voluntarily and to refuse at any point in the time without consequence of the study was explained to each patient.
* When they were fully convinced only then informed written consent was taken.
* The investigator not intervened to establish or mold any desired outcome.
* The investigator informed the concerned authority when any problem or confusion was raised.
* This research procedure was not hamper the ongoing treatment procedure of participants.

**3.20 SUMMARY BUDGET:**

|  |  |  |
| --- | --- | --- |
| 1 | Internet searching and document downloading | 10,000/- |
| 2 | Books and literature | 12,000/- |
| 3 | Printing and photocopy | 18,000/- |
| 4 | Data analysis, compose and binding | 25,000/- |
| 5 | Transport | 10,000/- |
| GRAND TOTAL = 75,000/- | | |

**3.21 Time Schedule:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Activities | 2017 | | | | | | 2018 | | | | | | | |
| Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul |
| Problem identification & Literature review |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Protocol development & acceptance |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Data collection |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Data analysis |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Thesis writing and binding |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Submission |  |  |  |  |  |  |  |  |  |  |  |  |  |

**CHAPTER 4**

**RESULTS**

**4.1. OBJECTIVE ONE**

**To find out the any possible relationship between socio-demographic factors with the substance use disorder patients.**

**Age**

Table 4.1 shows the mean age among respondents. The mean age for control group (Group A) was 29 whereas for case group (Group B), it was 31 years. Independent t-test showed that there was no significant difference between groups (p = 0.213).

**Table 4.1: Mean age of respondents**

|  |  |  |  |
| --- | --- | --- | --- |
| **AGE** | **Mean age** | | **p value** |
| **Study group** | |
| **Group-A (n=50)** | **Group-B (n=50)** |
| Respondents | 29 | 31 | 0.213 |

**Sex**

Frequency distribution of respondents according to sex is represented in Table 4.2. Chi-square test showed that there was no significant difference (p=0.646) between control group (Group-A) and substance user group (Group-B). Male respondents make up 96% (48 respondents) of Group-A 94% (47 respondents) of Group-B whereas female respondents make up another 4% and 6% of Group-A and Group-B, respectively.

**Table 4.2: Frequency distribution of respondents according to sex.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sex** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| Male | 48 (96) | 47 (94) | 0.646 |
| Female | 2 (4) | 3 (6) |
| Total | 50 (100) | 50 (100) |

**\***χ2 (Chi- square) test was employed to analyze the data.

**Religion**

Table 4.3 shows the distribution of respondents according to religion. Chi-square test shows no significant difference between two groups (p=0.110). In control group (Group-A), 84% of respondents (42) were Muslim while the other 16% (8) were Hindus whereas in substance user group (Group-B), 94% (47) were Muslim and the other 6% (3) were Hindus.

**Table 4.3: Frequency distribution of respondents according to religion.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Religion** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| Muslim | 42 (84) | 47 (94) | 0.110 |
| Hindu | 8 (16) | 3 (6) |
| Total | 50 (100) | 50 (100) |

**\***χ2 (Chi- square) test was employed to analyze the data.

**Marital Status**

Frequency distribution of respondents according to marital status is represented in Table 4.4. Chi-square test showed that there was no significant difference (p=0.258) between control group (Group-A) and substance user group (Group-B). There were 30 unmarried (60%) and 20 married (40%) respondents in Group-A whereas in Group-B, there were 23 married (46%), 26 unmarried (52%) and 1 divorced (2%).

**Table 4.4: Frequency distribution of respondents according to marital status.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Marital status** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| Unmarried | 30 (60) | 23 (46) | 0.258 |
| Married | 20 (40) | 26 (52) |
| Divorced | 0 (0) | 1 (2) |
| Total | 50 (100) | 50 (100) |

**\***χ2 (Chi- square) test was employed to analyze the data.

**Habitat**

Frequency distribution of respondents according to habitat is demonstrated in Table 4.5. Chi-square test showed that there was no significant difference (p=0.629) between control group (Group-A) and substance user group (Group-B). There were 40 respondents (80%) living in urban and 10 respondents (20%) living in rural area in Group-A whereas in Group-B, 76% (38 respondents) come from urban area while another 24% (12) come from rural area.

**Table 4.5: Frequency distribution of respondents according to habitant.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Habitant** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| Urban | 40 (80) | 38 (76) | 0.629 |
| Rural | 10 (20) | 12 (24) |
| Total | 50 (100) | 50 (100) |

**\***χ2 (Chi- square) test was employed to analyze the data.

**Educational Background**

Table 4.6 shows frequency distribution of respondents according to educational background. Chi-square test showed that there was significant difference (p<0.001) between control group (Group-A) and substance user group (Group-B). In Group-A, 3 of the respondents (6%) had primary level group, 6 respondents (12%) passed secondary exam, and rest 41 respondents (82%) belongs to group who were graduate. In Group-B, 3 of the respondents (6%) had primary level group, 34 respondents (68%) passed secondary exam, and 12 respondents (24%) belongs to graduated group while another 2% (1 respondent) was illiterate.

**Table 4.6: Frequency distribution of respondents according to educational background.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Education** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| Primary | 3 (6) | 3 (6) | <0.001 |
| Secondary | 6 (12) | 34 (68) |
| Graduate | 41 (82) | 12 (24) |
| Illiterate | 0 (0) | 1 (2) |
| Total | 50 (100) | 50 (100) |

**\***χ2 (Chi- square) test was employed to analyze the data.

**Occupation**

Table 4.7 represents frequency distribution of respondents according to occupation. Chi-square test showed that there was significant difference (p<0.001) between control group (Group-A) and substance user group (Group-B). In Group-A, 50% (25) were students of the group, 40% (20) were in service holders, 4% (2) in business, 1 respondent (2%) was unemployed and 4% (2) were in other group. In Group-B, only 6% (3) were students of the group, 34% (17) were in service holders, 26% (13) in business, 24% (12) were unemployed, and 10% (5) were in other group.

**Table 4.7: Frequency distribution of respondents according to occupation.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Occupation** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| Student | 25 (50) | 3 (6) | <0.001 |
| Service | 20 (40) | 17 (34) |
| Business | 2 (4) | 13 (26) |
| Unemployed | 1 (2) | 12 (24) |
| Others | 2 (4) | 5 (10) |
| Total | 50 (100) | 50 (100) |

**\***χ2 (Chi- square) test was employed to analyze the data.

**Family Income**

Frequency distribution of respondents according to family income is shown in Table 4.8. Chi-square test showed significant difference (p=0.041) between control group (Group-A) and substance user group (Group-B). In Group-A, monthly family income was <30000 taka for 7 respondents (14%), 30000-50000 taka for 25 respondents (50%), 50000-100000 taka for 13 respondents (26%) and >100000 taka for 5 respondents (10%). In Group-B, 8 respondents (16%) came from family that earned <30000 taka monthly, 13 respondents (26%) came from family that earned 30000-50000 taka monthly, 15 respondents (30%) came from family that earned 50000-100000 taka monthly and monthly family income for other 14 respondents (28%) was > 100000 taka.

**Table 4.8: Frequency distribution of respondents according to monthly family income.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Family income** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| <30000 | 7 (14) | 8 (16) | 0.041 |
| 30000-50000 | 25 (50) | 13 (26) |
| 50000-100000 | 13 (26) | 15 (30) |
| >100000 | 5 (10) | 14 (28) |
| Total | 50 (100) | 50 (100) |

**\***χ2 (Chi- square) test was employed to analyze the data.

**Family History of Psychiatric Illness**

Table 4.9 shows the comparison of family history of psychiatric illness between the respondents in control group (Group-A) and substance user group (Group-B). Chi-square test showed that there was significant difference (p=0.005) between control group (Group-A) and substance user group (Group-B). In Group-A, 6 out of 50 respondents (12%) had family suffering from psychiatric illness whereas the number of respondents with family suffering from psychiatric illness in Group-B was 18 or 36%.

**Table 4.9: Comparison of family history of psychiatric illness between control group and substance user group.**

|  |  |  |  |
| --- | --- | --- | --- |
| **History** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| Present | 6 (12) | 18 (36) | 0.005 |
| Absent | 44 (88) | 32 (64) |
| Total | 50 (100) | 50 (100) |

**\***χ2 (Chi- square) test was employed to analyze the data.

**Household Composition**

Table 4.10 represents the frequency distribution of household composition among respondents in control group (Group-A) and substance user group (Group-B). Chi-square test showed significant difference (p=0.036) between control group (Group-A) and substance user group (Group-B). In Group-A, 31 out of 50 respondents (62%) were from nuclear family, 16 respondents (32%) from joint family, 1 respondent (2%) lived with others and 2 respondents (4%) lived alone. In Group-B, 18 out of 50 respondents (36%) were from nuclear family, 27 respondents (43%) from joint family, and 5 respondents (10%) lived alone.

**Table 4.10: Frequency distribution of household composition among respondents.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Household composition** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| Nuclear | 31 (62) | 18 (36) | 0.036 |
| Joint | 16 (32) | 27 (43) |
| With others | 1 (2) | 0 (0) |
| Alone | 2 (4) | 5 (10) |
| Total | 50 (100) | 50 (100) |

**\***χ2 (Chi- square) test was employed to analyze the data.

**Monthly Self-Income**

Table 4.11 shows the frequency distribution of monthly self-income among respondents in control group (Group-A) and substance user group (Group-B). Chi-square test showed no significant difference (p=0.355) between control group (Group-A) and substance user group (Group-B). In Group-A, on a monthly basis, 12% (6) earning <10000 taka, 26% (13) earning 10000-20000 taka, 18% (9) earning 20000-30000 taka and the rest 24% (12) earning >30000 taka. In Group-B, on a monthly basis, 14% (7) earning <10000 taka, 22% (11) earning 10000-20000 taka, 6% (3) earning 20000-30000 taka and the rest 28% (14) earning >30000 taka. No income in group-A were 10 (20%) respondents, where in group-B were 15 (30%) respondents.

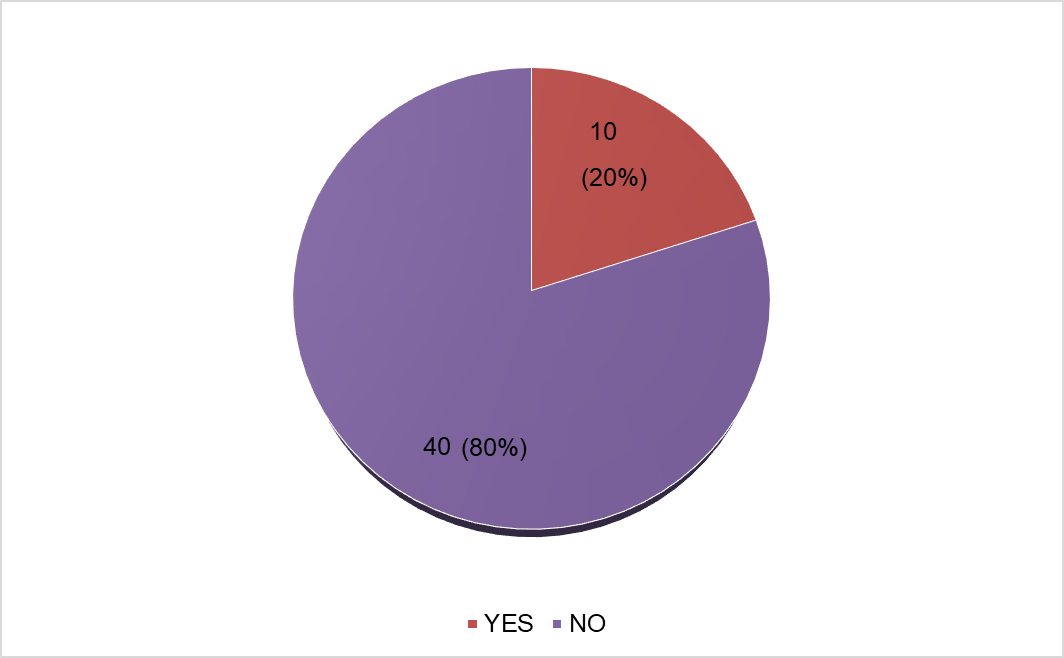
**Table 4.11: Frequency distribution of monthly self-income among respondents.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Self-income** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| <10000 | 6 (12) | 7 (14) | 0.355 |
| 10000-20000 | 13 (26) | 11 (22) |
| 20000-30000 | 9 (18) | 3 (6) |
| >30000 | 12 (24) | 14 (28) |
| NO INCOME | 10 (20) | 15 (30) |
| Total | 50 (100) | 50 (100) |

**\***χ2 (Chi- square) test was employed to analyze the data.

**Drug Usage among Family Members**

Figure 4.1 shows distribution of drug usage among family members in substance use group. There were 10 out of 50 respondents (20%) admitted to have drug users among family members and the rest 80% (40 respondents) did not have any family members using drugs.



**Figure 4.1**: Distribution of drug usage among family members among respondents in substance use group

**Age of Onset of Taking Drugs**

Figure 4.2 demonstrates age of onset of taking drugs among respondents in substance use group where 14% of respondents admitted started taking drugs as early as 10-15 years old, 38%, 32%, and 10% of respondents started taking drugs at the age of 16-20 years old, 21-25 years old, 26-30 years old, respectively, and 6% of respondents started taking drugs after the age of 30 years old.

**Figure 4.2**: Age of onset of taking drugs among respondents in substance use group.

**\*\*Type of Starter Drugs**

Figure 4.3 represents type of drugs being used at the beginning among respondents in substance use group. There were 12 (24%) of them use single drugs as starter whereas 76% (36) of respondents had started with more than one drug. The details of the drugs combination are shown in Table 4.12.

**Figure 4.3:** Types of drugs being used at the beginning among respondents in substance use group

**Table 4.12: Details of combination of at least two or more drugs being used by respondents as starter drugs.**

|  |  |
| --- | --- |
| **Name of substance** | **Frequency** |
| Cannabinoids + Alcohol | 6 |
| Cannabinoids + Heroin | 1 |
| Cannabinoids + Yaba | 2 |
| Cannabinoids + Alcohol + Inhalant | 2 |
| Cannabinoids + Alcohol + Sedatives | 2 |
| Cannabinoids + Heroin + Alcohol | 2 |
| Cannabinoids + Phensydil + Sedatives | 1 |
| Cannabinoids + Phensydil + Yaba | 3 |
| Cannabinoids + Yaba + Alcohol | 7 |
| Cannabinoids + Heroin + Alcohol, Inhalant | 1 |
| Cannabinoids + Heroin + Phensydil + Yaba | 1 |
| Cannabinoids + Phensydil + Alcohol + Sedatives | 1 |
| Cannabinoids + Phensydil + Yaba + Alcohol | 2 |
| Cannabinoids + Heroin + Yaba + Alcohol + Sedatives | 1 |
| Cannabinoids + Heroin + Yaba + Alcohol + Others | 1 |
| Cannabinoids + Phensydil + Yaba + Alcohol + Inhalant | 1 |
| Cannabinoids + Heroin + Phensydil + Yaba + Alcohol + Sedatives | 1 |
| Heroin + Inhalant | 1 |
| Heroin + Phensydil + Yaba | 1 |
| Yaba + Sedatives | 1 |
| **Total** | **38 (76%)** |

**Type of Drugs Currently Being Used**

Figure 4.4 shows distribution of currently in-use drugs by the respondents that fall under substance use group. The highest usage was Cannabinoids (38%), followed by combination of at least two or more drugs (32%). Yaba users make up 10% of the statistic followed by sedatives users (8%) while 6% of respondents currently did not take any drugs. Heroin and pethidine users make up 3% of the statistic. The proportions of the combination drugs being used is tabulated in Table 4.13.

**Figure 4.4**: Distribution of current drugs being used by respondents in substance use group.

**Table 4.13: Details of combination of at least two or more drugs currently being used by respondents.**

|  |  |
| --- | --- |
| **Name of Substances** | **Frequency** |
| Cannabinoids + Alcohol | 4 |
| Cannabinoids + Heroin | 1 |
| Cannabinoids + Yaba | 3 |
| Cannabinoids +Heroin + Alcohol | 1 |
| Cannabinoids + Heroin + Yaba | 1 |
| Cannabinoids + Phensydil + Alcohol | 1 |
| Cannabinoids + Phensydil + Yaba | 1 |
| Cannabinoids + Yaba + Inhalant | 1 |
| Heroin + Inhalant | 1 |
| Heroin + Yaba | 2 |
| **Total** | **16 (32%)** |

**Principal Drugs**

The details of principal drugs being used by respondents in substance use group is represented in Table 4.14. Cannabis shown the highest percentage (58%) of principal drug being used followed by Yaba (16%) and Heroin and Sedatives (8%). The percentage of respondents using Pethidine and Phensydil as principal drug were 2% and 4%, respectively. Combination of Cannabis + Alcohol was make up 2% of users and Heroin + Cocaine was 4%.

**Table 4.14: Details of main substance being used by respondents.**

|  |  |
| --- | --- |
| **Name of substances** | **Frequency** |
| Cannabis | 29 (58%) |
| Heroin | 4 (8%) |
| Pethidine | 1 (2) |
| Sedatives | 4 (8%) |
| Yaba | 8 (16%) |
| Phensydil | 2 (4%) |
| Cannabis + Alcohol | 1 (2%) |
| Heroin + Cocaine | 2 (4%) |
| **Total** | **50 (100%)** |

**Duration of Substance Usage**

Figure 4.5 shows the duration of substance usage among respondents. Highest percentage of duration among respondents was 1-5 years (58%), followed by 11-15 years (20%) and 6-10 and 15-20 years (6%). The longest duration (>20 years) were among 10% of the respondents.

**Figure 4.5:** Duration of substance usage among respondents.

**Routes of Substances**

Figure 4.6 shows distribution of routes of substance intake among respondents in substance use group. Majority of respondents (66%) taking the substance through smoking, followed by combination of smoking + swallowing (16%). Swallowing make up 12% of respondents, followed by combination of smoking + nasal intake (4%) and injection (2%).

**Figure 4.6**: Distribution of routes of substances intake among respondents.

**Treatment Received**

Figure 4.7 shows the number of treatments received by respondents among substance use group. There were 32 respondents (64%) received treatments 1-5 times, 7 respondents (14%) received treatments 6-10 times and 2 respondents (4%) had received treatments more than 10 times. Respondents that had never received any treatments make up 18% of the total respondents.

**Figure 4.7**: Number of treatments received by respondents

**Daily Expenses on Drugs**

Figure 4.8 shows daily expenses for drugs among respondents that fall under substance use group. Majority (56%) spent 0-250 taka daily for drugs, followed by >750 taka, (24%), 251-500 taka (18%) and 501-750 taka (2%).

**Figure 4.8:** Distribution of daily expenses for drugs among respondents in substance use group.

**Hospital Admission Due to Substance Usage**

Figure 4.9 shows hospital admission among respondents due to substance use. Twenty respondents (40%) were admitted to hospital once, and 8 respondents (16%) were admitted twice. However, 12 respondents (24%) had never been admitted to the hospital due to substance use. The details of the data can be seen in figure 4.9.

**Figure 4.9**: Hospital admission due to substance use among respondents.

**Physical health (DOM1), psychological (DOM2), social relationship (DOM3) and environment (DOM4), quality of life, quality of life perception (Q1) and score rate of health satisfaction (Q2) for different socio-demographic group among substance user respondents**

Table 4.15 illustrates socio-demographic effects and the summary of Generalized Linear Model significant results (p<0.05) on DOM1, DOM2, DOM3, DOM4, total score of quality of life, quality of life perception (Q1) and score rate of health satisfaction (Q2). Means separation using least significant different test (LSD) showed that educational background had significant effects on DOM4 and quality of life perception (Q1) and occupation had significant effects on DOM3. The other socio-demographic variables showed no significant effects on DOM1, DOM2, DOM3, DOM4, total score of quality of life, quality of life perception (Q1) and score rate of health satisfaction (Q2).

For academic educational variable, highest DOM4 scored was recorded respondents receiving secondary level of education (26.35) followed by primary level (25.67), however, both group’s scores were not significantly different. Graduated respondents scored 23.33 (which was not significantly different than scores received by primary level) and lowest scores were recorded among illiterate respondents (18.00). On the contrary, for life quality perception (Q1), respondents receiving primary level of education scored highest (3.67), followed by graduate level (3.00), secondary level (2.44) and lowest scores were from illiterate group (2.00).

For occupation variable, highest DOM3 scored was recorded in respondents involved in service industry (9.88) followed by others (9.20), unemployed respondents (8.75) and respondents involved in business (8.62). However, all the scores from the groups stated were not significantly different. Students on the other hand, recorded significantly lowest DOM3 score (5.33).

**TABLE 4.15 : Mean total score of physical health (DOM1), psychological (DOM2), social relationship (DOM3) and environment (DOM4), quality of life, score rate of quality of life (Q1) and score rate of health satisfaction (Q2) for different socio-demographic group among substance user respondents**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Grouping** | **MEAN SCORE OF QUALITY OF LIFE** | | | | | | |
| **DOM1** | **DOM2** | **DOM3** | **DOM4** | **TOTAL SCORE** | **Q1** | **Q2** |
| **Habitant** | Urban | 22.24a±0.88 | 18.03a±0.63 | 9.24a±0.34 | 25.87a±0.68 | 81.23a±2.08 | 2.68a±0.13 | 2.97a±0.15 |
| Rural | 20.58a±0.91 | 16.83a±1.17 | 8.00a±0.54 | 24.00a±0.85 | 74.58a±3.10 | 2.50a±0.34 | 2.67a±0.31 |
| ***P value*** | | 0.3213 | 0.3611 | 0.0727 | 0.1584 | 0.1227 | 0.5411 | 0.3464 |
| **Education background** | Primary | 24.67a±0.88 | 22.00a±1.00 | 10.00a±1.15 | 25.67ab±1.45 | 89.67a±4.26 | 3.67a±0.33 | 3.67a±0.33 |
| Secondary | 21.44a±0.86 | 17.29a±0.61 | 9.02a±0.32 | 26.35a±0.68 | 79.26a±2.12 | 2.44b±0.15 | 2.70a±0.17 |
| Graduate | 22.58a±1.59 | 18.17a±1.38 | 8.67a±0.76 | 23.33b±0.92 | 79.00a±3.85 | 3.00ab±0.25 | 3.25a±0.28 |
| Illiterate | 18.00a±0.00 | 15.00a±0.00 | 6.00a±0.00 | 18.00c±0.00 | 62.00a±0.00 | 2.00b±0.00 | 3.00a±0.00 |
| ***P value*** | | 0.5763 | 0.1997 | 0.3958 | **0.0288** | 0.2737 | **0.0400** | 0.1903 |
| **Occupation** | Student | 23.67a±0.67 | 17.00a±2.00 | 5.33b±0.67 | 23.00a±2.00 | 75.67a±4.41 | 3.33a±0.67 | 3.33a±0.33 |
| Service | 22.76a±1.39 | 18.05a±1.05 | 9.88a±0.42 | 24.94a±0.98 | 81.12a±3.20 | 2.65a±0.19 | 2.82a±0.29 |
| Business | 21.31a±1.29 | 17.31a±0.92 | 8.62a±0.31 | 26.77a±1.03 | 79.15a±2.94 | 2.54a±0.24 | 2.62a±0.24 |
| Unemployed | 21.25a±1.55 | 18.08a±1.19 | 8.75a±0.74 | 25.92a±1.28 | 79.58a±4.29 | 2.42a±0.29 | 3.17a±0.27 |
| Others | 20.40a±1.86 | 17.40a±2.14 | 9.20a±0.97 | 23.80a±1.56 | 76.80a±6.87 | 3.00a±0.45 | 3.00a±0.32 |
| ***P value*** | | 0.8005 | 0.9751 | **0.0069** | 0.4370 | 0.9439 | 0.4919 | 0.6152 |
| **Household composition** | Nuclear | 23.00a±1.29 | 18.17a±0.95 | 8.50a±0.54 | 24.89a±0.96 | 80.06a±3.24 | 2.56a±0.22 | 2.94a±0.24 |
| Joint | 21.11a±0.86 | 17.56a±0.76 | 9.15a±0.34 | 25.63a±0.68 | 78.96a±2.16 | 2.70a±0.18 | 2.81a±0.19 |
| Alone | 21.60a±2.73 | 17.20a±1.66 | 9.40a±1.40 | 26.20a±2.85 | 80.20a±7.88 | 2.60a±0.40 | 3.20a±0.37 |
| ***P value*** | | 0.4664 | 0.8362 | 0.5276 | 0.7532 | 0.9532 | 0.8636 | 0.7068 |
| **Marital status** | Unmarried | 22.47a±1.10 | 17.74a±0.88 | 8.91a±0.50 | 25.57a±0.89 | 80.22a±2.70 | 2.61a±0.19 | 2.91a±0.22 |
| Married | 21.54a±0.92 | 17.69a±0.73 | 8.92a±0.36 | 25.31a±0.76 | 79.04a±2.48 | 2.69a±0.18 | 2.88a±0.19 |
| Divorced | 15.00a±0.00 | 19.00a±0.00 | 10.00a±0.00 | 25.00a±0.00 | 74.00a±0.00 | 2.00a±0.00 | 3.00a±0.00 |
| ***P value*** | | 0.3140 | 0.9494 | 0.8807 | 0.9705 | 0.8650 | 0.7399 | 0.9899 |

N.B. Means with the same letter within the columns are not significantly different (p<0.05) using LSD test. ***P*** = probability value from generalized linear model. ***SE*** = standard error

**4.2 OBJECTIVE TWO**

**To find out the relationship between various type of substance use and the quality of life.**

**Quality of Life**

Substance use’s effects and the summary of Generalized Linear Model significant results (p<0.05) on total score of quality of life, score rate of quality of life (Q1) and score rate of health satisfaction (Q2) are presented in Table 4.16. Means separation using least significant different test (LSD) showed that substance uses had significant effects on all three variables (total score, Q1 and Q2). Details of each results was discussed in Figure 4.10, 4.11 and 4.12.

**Table 4.16:** **Mean total score of quality of life, score rate of quality of life (Q1) and score rate of health satisfaction (Q2) among control group and substance users**

|  |  |  |  |
| --- | --- | --- | --- |
| **SUBSTANCE** | **Total score ± SE**  **(p value <0.0001)** | **Q1 ± SE**  **(p value<0.0001)** | **Q2 ± SE**  **(p value<0.0001)** |
| Control | 90.46a ± 1.20 | 3.8a ± 0.07 | 3.78a ± 0.10 |
| Cannabinoids | 84.47a ± 3.37 | 2.58b ± 0.25 | 2.84a ± 0.26 |
| Cannabinoids combinations | 79.08b ± 2.76 | 2.38b ± 0.21 | 2.69b ± 0.21 |
| Heroin | 73.80b ± 6.11 | 2.80b ± 0.20 | 2.80b ± 0.58 |
| Others | 75.90b ± 3.05 | 2.90b ± 0.28 | 3.30a ± 0.26 |
| None | 71.00b ± 4.04 | 3.00ab ± 0.28 | 3.00a ± 0.58 |

N.B. Means with the same letter within the columns are not significantly different (p<0.05) using LSD test. ***P*** = probability value from generalized linear model. ***SE*** = standard error. ***Cannabinoids combination*** = Cannabinoids + Alcohol, Cannabinoids + Heroin, Cannabinoids + Yaba, Cannabinoids +Heroin + Alcohol, Cannabinoids + Heroin + Yaba, Cannabinoids + Phensydil + Alcohol, Cannabinoids + Phensydil + Yaba and, Cannabinoids + Yaba + Inhalant. ***Others*** = Pethidine, Sedatives and Yaba (single drugs). ***None*** = Drug users that not taking any drugs at the moment.

**Total Score of Quality of Life**

Figure 4.10 represents the effects of substance use on total score of quality of life. Highest score was recorded in control group (90.46) but the score was not significantly difference compared to total score recorded for Cannabinoids users (84.47). However, the total score was significantly lower (compared to control and Cannabinoids users) in users combining Cannabinoids and other drugs (79.08). Total score for Heroin and other drugs users and other drugs were 73.80 and 75.90, respectively, which were also significantly lower than total score recorded for control group and Cannabinoids user group but were not significantly different than total score for users combining Cannabinoids. Respondents that did not taking any drugs at the moment however also showing lower total score (71.00) compared to control group and Cannabinoids user group but were not significantly different than the other groups of substance users.

**Figure 4.10:** Effects of substance use on total score of Quality of Life. Means with the same letter are not significantly different by LSD test at p≤0.05. Error bar indicates standard error.

**Score Rate of Life Quality Perception (Q1)**

Figure 4.11 shows the effects of substance use on score rate of quality of life. Highest score was recorded in control group (3.8), followed by users that did not taking any drugs currently (3.00) while the lowest score rate was recorded for using combing Cannabinoids and other drugs (2.38). Cannabinoids, Heroin, and other drugs users scored 2.58, 2.80 and 2.90, respectively, which were significantly lower than control group.

**Figure 4.11:** Effects of substance use on score rate of Quality of Life. Means with the same letter are not significantly different by LSD test at p≤0.05. Error bar indicates standard error.

Table 4.17 shows the frequency distribution of the scoring of quality of life’s perception among respondents in control group (Group-A) and substance user group (Group-B). Chi-square test showed that there was significant difference (p<0.0001) between control group (Group-A) and substance user group (Group-B). In control group, none of the respondents rated the quality of their life as very poor and poor, 24% of the respondents rated their quality of life as neither good nor poor, 72% rated their life as good and the rest 4% rated their life as very good. However, Group-B 8% of respondents rated the quality of their life as very poor, 40% rated poor, 32% rated neither good nor poor, 20% rated the quality of their life as good and none rated the quality of their life as very good.

**Table 4.17: Scoring details of Perception of Quality of Life**

|  |  |  |  |
| --- | --- | --- | --- |
| **Rating/Score** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| Very poor (1) | 0 | 4 (8) | <0.001 |
| Poor (2) | 0 | 20 (40) |
| Neither good nor poor (3) | 12 (24) | 16 (32) |
| Good (4) | 36 (72) | 10 (20) |
| Very good (5) | 2 (4) | 0 |
| Total | 50 (100) | 50 (100) |

**\***χ2 (Chi- square) test was employed to analyze the data.

**Health Satisfaction (Q2)**

Figure 4.12 shows effects of substance use on score rate of health satisfaction. Highest score was recorded in control group (3.78), but the scores were not significantly different than Cannabinoids users (2.84), users taking other drugs (3.30) and users that currently not taking any drugs (3.00). Heroin users scored significantly lower (2.80) compared to the previous groups of users and lowest score was recorded by users combining Cannabinoids and other substances (2.69).

**Figure 4.12:** Effects of substance use on health satisfaction score. Means with the same letter are not significantly different by LSD test at p≤0.05. Error bar indicates standard error.

**Score Rate of Health Satisfaction**

Table 4.18 shows frequency distribution of the scoring of quality of life’s perception among respondents in control group (Group-A) and substance user group (Group-B). Chi-square test showed significant difference (p<0.0001) between control group (Group-A) and substance user group (Group-B). In control group, none of the respondents rated their health satisfaction as very dissatisfied, 6% rated their health satisfaction as dissatisfied, 18% of the respondents rated their health satisfaction as neither satisfied nor dissatisfied, 68% rated as satisfied and the rest 8% rated as very satisfied. For Group-B 8% of respondents rated their health as very dissatisfied, 26% rated dissatisfied, 36% rated neither satisfied nor dissatisfied, 28% rated their health as satisfied and 2% rated as very satisfied.

**Table 4.18: Scoring details for Health Satisfaction**

|  |  |  |  |
| --- | --- | --- | --- |
| **Rating/Score** | **Study group** | | **p value** |
| **Group-A (n=50)**  **Frequency (%)** | **Group-B (n=50)**  **Frequency (%)** |
| Very dissatisfied (1) | 0 | 4 (8) | <0.001 |
| Dissatisfied (2) | 3 (6) | 13 (26) |
| Neither satisfied nor dissatisfied (3) | 9 (18) | 18 (36) |
| Satisfied (4) | 34 (68) | 14 (28) |
| Very satisfied(5) | 4 (8) | 1 (2) |
| Total | 50 (100) | 50 (100) |

**Physical Health, Psychological, Social Relationship and Environment Domain**

Comparing domain scores for physical health (DOM1), psychological (DOM2), social relationship (DOM3) and environment (DOM4) between control group (Group-A) and substance use group (Group-B), independent t-test showed that there was significant difference (p<0.05) between two groups in terms of DOM1, DOM2 and DOM3 but DOM4 showed no significant difference (Table 4.19). Group-A showed significantly high score for DOM1 (26.62), DOM2 (20.98) and DOM3 (10.24) compared to Group-B which scored 21.48, 17.74 and 8.94 for DOM1, DOM2 and DOM3, respectively. Group-A scored 25.08 for DOM4, which is not significantly different than Group-B (25.42).

**Table 4.19: Comparison of Domain score for DOM1, DOM2, DOM3 and DOM4 between control group and substance use group.**

|  |  |  |  |
| --- | --- | --- | --- |
| **DOMAIN** | **STUDY GROUP** | | **P VALUE** |
| **Group-A (n=50)**  Mean ± SE | **Group-B (n=50)**  Mean ± SE |
| PHYSICAL HEALTH | 26.62 ± 0.39 | 21.84 ± 0.70 | <0.001 |
| PSYCHOLOGICAL | 20.98 ± 0.39 | 17.74 ± 0.55 | <0.001 |
| SOCIAL RELATIONSHIP | 10.24 ± 0.25 | 8.94 ± 0.29 | 0.0012 |
| ENVIRONMENT | 25.08 ± 0.57 | 25.42 ± 0.56 | 0.6731 |

**OBJECTIVE THREE**

**To find out the relationship between routes of substance use and the quality of life.**

Routes of substance use and the summary of Generalized Linear Model significant results (p<0.05) on total score of quality of life, score rate of quality of life (Q1) and score rate of health satisfaction (Q2) are presented in Table 4.20. Means separation using least significant different test (LSD) showed no significant difference between different routes on quality of life total score, Q1 and Q2’s scores.

**Table 4.20: Mean total score of quality of life, score rate of quality of life (Q1) and score rate of health satisfaction (Q2) for different routes of substance intake**

|  |  |  |  |
| --- | --- | --- | --- |
| **ROUTES** | **Total score ± SE**  **(p value <0.9526)** | **Q1 ± SE**  **(p value<0.2371)** | **Q2 ± SE**  **(p value<0.5046)** |
| Injection | 73.00a ± 0.00 | 4.00a ± 0.00 | 2.00a ± 0.00 |
| Smoking | 79.61a ± 2.50 | 2.67a ± 0.16 | 3.06a ± 0.18 |
| Smoking + Nasal | 74.00a ± 0.00 | 2.00a ± 0.00 | 3.00a ± 0.00 |
| Smoking + Swallowing | 80.50a ± 3.25 | 2.88a ± 0.30 | 2.63a ± 0.26 |
| Swallowing | 80.33a ± 3.70 | 2.17a ± 0.31 | 2.50a ± 0.43 |

N.B. Means with the same letter within the columns are not significantly different (p<0.05) using LSD test. ***P*** = probability value from generalized linear model. ***SE*** = standard error

Table 4.21 represents routes of substance use and the summary of Generalized Linear Model significant results (p<0.05) on score of physical health (DOM1), psychological (DOM2), social relationship (DOM3) and environment (DOM4). Means separation using least significant different test (LSD) showed no significant difference between different routes on the scores of physical health (DOM1), psychological (DOM2), social relationship (DOM3) and environment (DOM4).

**Table 4.21: Mean score of DOM1, DOM2, DOM3 and DOM4 for different routes of substance intake**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ROUTES** | **DOM1 ± SE**  **(p<0.1912)** | **DOM2 ± SE**  **(p<0.9672)** | **DOM3 ± SE**  **(p<0.8822)** | **DOM4 ± SE**  **(p<0.9078)** |
| Injection | 18.00a ± 0.00 | 16.00a ± 0.00 | 8.00a ± 0.00 | 25.00a ± 0.00 |
| Smoking | 22.12a ± 0.91 | 17.58a ± 0.76 | 8.85a ±0.41 | 25.24a ± 0.73 |
| Smoking + Nasal | 15.50a ± 0.50 | 17.50a ± 1.50 | 10.00a ± 0.00 | 26.00a ± 1.00 |
| Smoking + Swallowing | 20.50a ± 1.27 | 18.50a ± 1.04 | 9.38a ± 0.60 | 26.63a ± 1.35 |
| Swallowing | 24.33a ± 1.78 | 18.00a ± 1.39 | 8.67a ± 0.56 | 24.67a ± 1.82 |

N.B. Means with the same letter within the columns are not significantly different (p<0.05) using LSD test. ***P*** = probability value from generalized linear model. ***SE*** = standard error

**CHAPTER 5**

**DISCUSSION**

**5.1 To find out the any possible relationship between socio-demographic factors with the substance use disorder patients.**

From the results sections, comparing the control group and substance use group, variables include educational background, occupation, family income, family history of psychiatric illness and household composition showed significant difference between two groups whereas the other socio-demographic variables include age, sex, religion, marital status, habitant and monthly personal income did not show significant difference.

The mean age for control group (Group A) was 29 whereas for case group, (Group B) was 31 years old. Independent t-test showed that there was no significant difference between groups (p = 0.213). Sex variable showed no significant difference between Group-A and Group-B too (p=0.646) where the percentage of male was 96% in Group-A and 94% in Group-B. The results of these two variables implying that both groups are of matched age and sex as suggested in WHO-QOL manual.

There was no significant difference in religion between control Group-A and Group-B. In control group (Group-A), 84% of respondents were Muslim while the other 16% were Hindus whereas in substance user group (Group-B), 94% were Muslim and the other 6% were Hindus. It was expected to have higher percentage of Muslims respondents compared to other religions due to Bangladesh is occupied by more than 90% Muslims and less than 10% Hindus. There was also no significant difference between the control group (Group-A) and substance user group (Group-B) on marital status. There were 60% unmarried and 40% married respondents in Group-A whereas in Group-B, there were 46% married, 52% unmarried and 2% divorced respondents. The recorded data is in line with a study Astals et al. (2008) where they reported that there was higher percentage of single respondents (54%) compared to married (30.1%) and divorced (15.9%) in their investigation of impact of substance dependence and dual diagnosis on the quality of life of heroin users seeking treatment, among 189 respondents. Furthermore, Grant et al. (2009) reported in their study of one-year incidence and associations of DSM-IV substance use disorders, that among 34653 civilians, the odd ratio of drug dependency (using DSM-IV) was higher among unmarried subjects (0.9), compared to married (0.1) and divorced subjects (0.4).

For habitat variable, chi-square results showed no significant difference between control group (Group-A) and substance user group (Group-B). There were 80% respondents living in urban and 20% respondents living in rural area in Group-A whereas in Group-B, 76% coming from urban area while the other 24% coming from rural area. The results also indicate that there was higher number of respondents from urban area compared to rural area, among the substance use group. This is in-line with Grant et al. (2009) where they reported that odd ratio of drugs dependency was higher in patients from urban area (0.3) compared to patients from rural area (0.2).

Chi-square test also showed that there was significant difference (p=0.036) between control group (Group-A) and substance user group (Group-B) for household composition. In Group-A, 62% respondents were from nuclear family, 32% from joint family, 2% lived with others and 4% lived alone whereas in Group-B, 36% were from nuclear family, 43% from joint family, and 10% lived alone. However, further analysis on quality of life among substance use group showed that, household composition did not significantly affecting total score of quality of life, life quality perception, and health satisfaction, DOM1, DOM2, DOM3 and DOM4. Astals et al. (2008) had a similar findings in their research on 189 opioid-dependent patients where they observed higher percentage of patients living in joint family (73%) compared to opioid-dependent patients living alone (20.1%) and the rest were homeless (6.9%), however there was no significant difference on the impact of quality of life (HRQoL) by the SF-12 (PCS-12 and MCS-12 scales), within the group.

There was no significant difference on monthly self-income between Group-A and Group-B, however, Chi-square test showed that there was significant difference between Group-A and substance user Group-B on monthly family income. The results of monthly self-income showed that there was higher percentage of respondents without monthly income in Group-B (30%) compared to Group-A (20%) and 42% of respondents in Group-A earning more than 20000 monthly compared to 34% in Group-B. Annual Drug Report of Bangladesh (DNC 2013) reported that despite having no income, the percentage of drug addicts was higher in this group amounting 57.3% in 2012 and 54.5 in 2013. Contradicting the above results, Group-B having comparatively higher family income compared to Group-A, where 58% of the respondents in Group-B earned more than 50000 taka monthly, compared to only 36% in Group-A. Grant et al. (2008) reported similar results where odd ratio of drugs dependency was higher in higher income family (1.4) compared to lower income family (1.0). Department of Narcotic Control Bangladesh (2013) also reported that certain substances such as Yaba was closely related to the adolescents of aristocratic society, particularly among the English medium students of Dhaka city and has now became a symbol of smartness, fashion and aristocracy. There were also many reported cases children of rich people found involved in Yaba trading.

Group-B also showing higher percentage of family members having psychiatric illness (36%) compared to Group-A (12%). Continuous support to the family members having psychiatric illness has become serious stressful for the normal person which ultimately led his/her to be involved with substance and developed of psychiatric disorder like depression found by Osman et al. (2010). Previous studies have linked depressive disorder with substance abuse and dependency, where patients suffering from depressions and other mental disorders develop higher chances of developing substance use disorder (Drake et al. 1998; Drake, O’Neal, and Wallach 2008). Astal et al. (2008) reported 12.7% and 18% of lifetime major depressive patients and mood disorder patients, respectively, involved in Heroin addiction.

Educational background is highly associated with occupational variable. For educational background, it was shown that there were higher percentage of graduate respondents in Group-A (82%) compared to Group-B (24%). In contrast, higher unemployment was recorded in Group-B (24%), compared to Group-A (2%). Generalized linear model analysis resulted in significant difference of DOM4 and life quality perception among substance use respondents. Mean separation using LSD showed that highest DOM4 score recorded in respondents receiving secondary level of education followed by primary level, however, lowest scores were recorded among graduate respondents and illiterate respondents. On the contrary, for life quality perception, respondents receiving primary level of education scored highest (3.67), followed by graduate level (3.00), secondary level (2.44) and lowest scores were from illiterate group (4.00). Highest DOM3 scored was recorded in respondents involved in service industry, followed by others, unemployed respondents and respondents involved in business. However, all the scores from the groups stated were not significantly different. Students on the other hand, recorded significantly lowest DOM3 score.

Previous researches had linked poorer academic achievement and higher rate of unemployment with substance use disorder. A finding from a survey conducted by Fergusson and Boden (2008) in New Zealand suggested that increasing cannabis use in adolescence and early adulthood is associated with a range of adverse outcomes in later life. They found out that increasing levels of cannabis use at ages 14-21 attributed to lower level of degree attainment and poor education by age 25; lower income at age 25; higher levels of welfare dependence; higher unemployment; lower levels of relationship satisfaction and lower levels of life satisfaction were associated with the increasing levels of cannabis use at ages 14-21. Astal et al. (2008) reported that among 189 Heroin users in their study, 40.2% of the respondents only passed primary level of schooling, and 37% passed secondary level and only 22.8% graduate. However, Brierea et al. (2014) had a contrasting finding where a study conducted in Quebac, Canada among students showed that early onset illicit drug use predicts conduct problems and school dropout, but not academic achievement and depressive symptoms.

**Relationship of Age of Onset, Cannabis and other illicit drugs**

The social transitions that occur during adolescence and young adulthood (age of 10–24 years) are essential for a young person’s later life trajectories. Recent estimates by Substance Abuse and Mental Health Services Administration (2014) indicate that the majority (74.0%) of substance abusers admitted in treatment center began substance use at the age of 17 or younger and 10.2% initiated use at the age of 11 or younger. This study is in line with the report as based on the results, 14% of respondents admitted started taking drugs as early as 10-15 years old, 38%, 32%, and 10% of respondents started taking drugs at the age of 16-20 years old, 21-25 years old, 26-30 years old, respectively, and 6% of respondents started taking drugs after the age of 30 years.

Another study conducted in Nepal among drug users revealed that majority (95.0%) of the drug users initiated substance use before they reach 25 years. Furthermore, more than 81.2% drug users have experience of first time drug intake before the age of 20 years and more than 32% of drug users took drug first time in their life as early as 15 years. Whereas in Bangladesh, about 80% from 2.5 million of the drug addicts are youths aged 15 to 30 years old (Shazzad et al. 2014). The data collected in this study are in line with the previous collected data, where substance use respondents started using drugs as early as the age of 10-15 years where majority of respondents (38%) started taking drugs at 16-20 years and 32% of respondents started at the age of 21-25 years old. Substance use may also be influenced by family member as in this study, 80% substance use respondents admitted having family members using drugs.

The distribution of onset of taking drug, main drugs and current drugs of substance use respondents showed that Cannabis was the major drugs used in all three categories. Data collected for onset of drugs also showed that substance use respondents combining Cannabis with other substances such as alcohol, Heroin, Yaba and Phensydil. The results from this study supported a study conducted by Fergusson and Boden (2008) where they demonstrated that young people using cannabis at substantially increased risks of later illicit drug use. These effects appeared to vary with age, with younger (14–15 years old) heavy users of cannabis being far more susceptible to other illicit drug use than older (20–21 years old). Even though the mechanisms that lead to these linkages between age and the impact of cannabis use on risks of illicit drug use has yet to be established, Ferguson and Boden (2008) suggested that the increase of risk of using other illicit drugs among cannabis users involve two processes. In the first process they explained that, since the use of cannabis is illegal in New Zealand (where the study was conducted), those using cannabis will often need to obtain their supplies from drug dealers thus, the contact may also expose the users to greater access and temptations to use other illicit drugs. Under this model the linkages between cannabis use and illicit drug use may be largely a consequence of illegal status of cannabis and the consequent linkage of the supply of cannabis with illegal drug markets (Cohen 1972; Fergusson *et al*. 1993; MacCoun 1998; Fergusson & Horwood 2000).

This scenario is relatable to cannabis users in Bangladesh as cannabis is categorised as illegal in Bangladesh. The second explanation the regular use of cannabis may encourage the user to experiment with other illicit drugs (Fergusson & Horwood 2000; MacCoun 1998) in various ways. Under this model the linkages between cannabis use and other illicit drug use arise from a causal chain model in which increasing use of cannabis increases the likelihood of experimentation with other illicit drugs (Fergusson and Boden 2008). The findings of this study replicate and extend previous studies of this cohort that have shown the presence of strong associations between cannabis use and other forms of illicit drug use (Fergusson & Horwood 1997, 2000).

**5.2 To find out the relationship between various type of substance use and the quality of life.**

Substance dependency is widely known to be negatively affecting the users, physically and mentally, thus affecting overall quality of life. It has already proven that abuse of drugs has a wide range of adverse effects on human civilization. Drugs have the capacity to alter mood, perception, cognition and behavior and therefore have the potential to influence, either positively or negatively, quality of life (Fischer 2015). The negative side effects of substance dependency varied form one drug to another. For instance, Phensydil users are prone to drowsiness, constipation and orthostatic hypotension, Pethidine users are prone to decrease in kidney function, toxic leukoencephalopathy, slurred speech and walking difficulty in Heroin users, nausea, vomiting, dizziness, diaphoresis, urinary retention and over dosage may cause muscle flaccidity, respiratory depression, obtundedness, cold and clammy skin, hypotension and coma whereby acute adverse effects of Cannabis include anxiety and panic attack, psychotic symptoms, chronic bronchitis and impaired respiratory function in regular smokers and subtle cognitive impairment (daily users of 10 and above) (Shazzad et al. 2014).

The findings of this study supported the previous research where there is apparent decline in overall quality of life among substance users. The results showed that control group scored higher total score of quality of life. However, the score was not significantly difference in Cannabis user group. The rest of the groups scored lower quality of life scored. For perception of quality of life, control group scored higher rate, followed by followed by users that did not taking any drugs currently while the lowest score rate was recorded for using combing Cannabinoids and other drugs. Respondents using Cannabinoids, Heroin, and other drugs users shown to scored lower compared to control group. For health satisfaction variable, highest score was recorded in control group, but the scores were not significantly different than Cannabinoids users, users taking other drugs and users that currently not taking any drugs. Heroin users scored significantly lower compared to the previous groups of users and lowest score was recorded by users combining Cannabinoids and other substances.

Comparing domain scores for physical health (DOM1), psychological (DOM2), social relationship (DOM3) and environment (DOM4) between control group (Group-A) and substance use group (Group-B), independent t-test showed that there was significant different (p<0.05) between the two groups in terms of DOM1, DOM2 and DOM3 but DOM4 showed no significant different. Group-A showed significantly higher score for DOM1 (26.62), DOM2 (20.98) and DOM3 (10.24) compared to Group-B which scored 21.48, 17.74 and 8.94 for DOM1, DOM2 and DOM3, respectively. Group-A scored 25.08 for DOM4, which is not significantly different than Group-B (25.42).

It can be concluded that from this survey, substance use group shown to have lower score in total score of quality of life, quality of life perception (Q1), health satisfaction (Q2), DOM1, DOM2 and DOM3 compared to control. Negative impacts of substance dependency on physical and mental health and overall life quality is well established. The results of this study supported the claims of previous researches where substance use disorder is associated with the incline of mental and physical health. Earlier study conducted by Ross, Glaser, and Germanson (1988) showed that from the information gathered using the National Institute of Mental Health Diagnostic Interview Schedule (DIS) and computer diagnoses generated according to DSM-III criteria, 78% from 501 substance addicted patients developed lifetime psychiatric disorder and 68% had a current DIS mental disorder. The findings of this study are also in line with a study conducted by Bizzarri et al. (2005) where they compared the scores of DOM1, DOM2, DOM3 and DOM4 (using *WHOQOL-BREF)* between a healthy patients and substance dependents group (opiates dependents in this case), healthy patients scored higher DOM1 (30%), DOM2 (34%) and DOM3 (27%). However, the scores between the two groups were not significantly different for DOM4 where healthy patients scored 59.18 whereas substance dependents group scored 52.99. These results are also consistent with studies conducted by Frisher et al. (2004) using SF-36 and Torrens et al. (1997) the Nottingham Health Profile (NHP). Moreover, Lugoboni et al. (2014) also reported a similar finding from their study on quality of life in a cohort of high-dose benzodiazepine dependent patients, measured by SF-36. Their results showed that the scores for physical functioning, role physical, bodily pain, general health and vitality were 10.1%, 42.7%13.5%, 15.1% and 25.6%, respectively, lower in benzodiazepine dependent patients compared to the expected value (of normal civilians). Furthermore, benzodiazepine dependent patients also scored 41.2%, 47.2% and 24.1%, lower in social functioning, role-emotional and mental health, respectively.

**5.3** **To find out the relationship between routes of substance use and the quality of life.**

The results from this study showed that routes of administration of substances did not have any significant effects on total quality of life, life quality perception, health satisfaction, physical health, psychological, social relationship and environment domain and possess the same level of decline of physical and mental health, and overall life quality.

The findings contrasting a study conducted by Novak and Kral (2011) where they found that injection drug use (IDU) users scored lower perceived general health (21% versus 13% reporting fair/poor health) and a higher prevalence of major depressive episodes (26% versus 18%), compared to non-IDUs. In terms of substance use characteristics, 60% of IDUs met the DSM-IV criteria for abuse and/or dependence compared to 27% of non-IDUs. However, Astal et al. (2008) reported similar results to our study, where they found that among 179 heroin dependent patients, non-IDU patients scored higher PCS-12 and MCS-12 (using SF-12) compared to IDU patients but scores were not significantly different (p=0.560) among smoking, nasal, and injectable users. Patients taking the drug through smoking and nasal scored 42.8 and 44.2, respectively, compared to patients taking injection, which scored 42.0 in PCS-12 whereas for MCS scores, smoking and nasal routes patients scored 37.7 and 37.8, respectively and injection route patients scored 32.5. From our findings, we concluded that regardless of the routes of administration, the use of illicit substances itself hampering the health and overall life quality of its users as established in previous literatures.

**CHAPTER SIX**

**CONCLUSION**

**6.1 Conclusion**

Control group and Cannabinoids users did not show significant difference in scores total score quality of life and health satisfaction. However, other drug groups (Cannabinoids combination, Heroine, users not taking any drugs currently) showing significantly lower scores. For life quality perception, significantly highest score was recorded in control group, followed by users that did not taking any drugs currently, while the lowest score rate was recorded for using combing Cannabinoids and other drugs. Cannabinoids, Heroin, and other drugs users scored showing lower rate than control but higher rate than Cannabinoids combination other drugs.

Comparing domain scores for physical health (DOM1), psychological (DOM2), social relationship (DOM3) and environment (DOM4) between control group and substance use group, Control group showed significantly higher score for DOM1 (26.62), DOM2 (20.98) and DOM3 (10.24) compared to substance use group which scored 21.48, 17.74 and 8.94 for DOM1, DOM2 and DOM3, respectively. However, no significant difference detected for DOM4 between two groups. Routes of substance also did not significantly affect overall quality of life of substance use patients.

The findings of this study showed that substance use patients had overall lower quality of health compared to control. Therefore, null hypothesis is rejected, and alternate hypothesis (hypothesis in this study) is established.

**6.2 Limitation of Study**

1. Purposive sampling method was applied in this study which may bias the result of the study.
2. Since this was a cross-sectional study, the causal link was not established.
3. Sample size was small. Larger sample size may more validate the result of the study.
4. The measurement of health outcomes was based on self-reports, not objective measures of health status; it did not measure differences in patient’s characteristics and extraneous factors that may be confounding to the results.

**6.3 Recommendation**

1. As quality of life is an important parameter of one’s total wellbeing, its deterioration should be highlighted to those subjects and their family members which may create a negative impact on their mind and help refrain them from taking substances.

2. Psychiatrist, psychologists and those have social services for this group of population should come forward with a holistic approach to combat the situation keeping in mind that it has extreme negative impact not only on the particular patients but also to the society as a whole.

3. For better understanding of the issues, further multi-centered prospective and population-based studies with appropriate research tools can be carried out.

**REFERENCES:**

Ahad, Abdul, Mitu Chowdhury, and Badrul Islam. 2017. “Socioeconomic Status of Young Drug Addicts in Sylhet” 22 (6): 84–91.

American Psychiatric Association. 2013. “Diagnostic and Statistical Manual of Mental Disorders: DSM-5.” *American Psychiatric Association*, 991.

Anthony, JC, Warner, LA and Kessler, RC. 1994. Comparative epidemiology of dependence on tobacco, alcohol, controlled substances, and inhalants: basic findings from the National Comorbidity Survey. *Exp Clin Psychopharmacol* 2:244–68.

Astals, M., Domingo-Salvany, A., Buenaventura, C.C., Tato, J., Vazquez, J.M., Martín-Santos, R., Torrens, M., 2008. Impact of Substance Dependence and Dual Diagnosis on the Quality of Life of Heroin Users Seeking Treatment. *Substance Use & Misuse* 43, 612–632.

Barr, AM, Panenka, WJ, MacEwan, GW, Thornton, AE, Lang, DJ, Honer, WG, and Lecomte, T. 2006. "The need for speed: an update on methamphetamine addiction". *J Psychiatry Neurosci* 31:301-13.

Bizzarri, Jacopo, Paola Rucci, Alessia Vallotta, Massimo Girelli, Anna Scandolari, Elisabetta Zerbetto, Alfredo Sbrana, Claudia Iagher, and Elio Dellantonio. 2005. “Dual Diagnosis and Quality of Life in Patients in Treatment for Opioid Dependence.” *Substance Use & Misuse* 40 (12): 1765–76.

Bloom, F. 2001. Acetylcholine. *In* De-Wit, RC, Caroll KM, Fagan, J, Kranzler, HR and Kuhar, MJ. (eds). *Encyclopaedia of Drugs, Alcohol and Addictive Behaviour 2nd Edition (Vol. 1).* Macmillan Reference; USA

Brière, F N, P Rohde, J R Seeley, D Klein, and P M Lewinsohn. 2014. “Comorbidity between Major Depression and Alcohol Use Disorder from Adolescence to Adulthood.” *Comprehensive Psychiatry* 55 (3):526–33.

Bullinger, M. 1991. Quality of life: definition, conceptualization and implications – a methodologist’s view. *Theoretical Surgery* 6:143-8

.

Calman, KC. 1984. “Quality of Life in Cancer Patients - an Hypothesis.” *Journal of Medical Ethics* 10:124–27

Cowen, Philip, Paul Harrison, and Tom Burns. 2012. “Shorter Oxford Textbook of Psychiatry.” Oxford Univeristy Press, no. 6: 138–39.

Cruickshank, CC. and Dyer, KR. 2009. "A review of the clinical pharmacology of methamphetamine.". *Addiction* 1 0 4 : 1 0 8 5 - 9 9 .

Darke, S. Kaye, S. McKetin, R. and Duflou, J. 2008. "Major physical and psychological harms of methamphetamine use". *Drug Alcohol Rev* 27:253-62.

Degenhardt, L, Whiteford, HA, Ferrari AJ, et al. 2013. Global burden of disease attributable to illicit drug use and dependence: findings from the Global Burden of Disease Study 2010. *Lancet* 382:1564–74.

Department of Narcotics Control. 2014. “Annual Drug Report of Bangladesh,” 1–86.

Des, Jarlais DC, Diaz, T, Perlis, T, Vlahov, D, Maslow, C, Latka, M, et al. 2003. Variability in the incidence of human immunodeficiency virus, hepatitis B virus, and hepatitis C virus infection among young injecting drug users in New York City. *Am J Epidemiol.* 157(5):467–471.

Dettmeyer, RB, Preuß, J, Wollersen, H and Madea, B. 2005. "Heroin-associated nephropathy". *Expert Opinion on Drug Safety*. 4:19-28.

Diener, Ed. 1984. “Subjective Well-Being.” *Psychological Bulletin* 95 (3):542–75.

B. Sadok, V. Sadok, P. Ruiz. 2015. “KAPLAN & SADOCK’S Synopsis of Psychiatry Behavioral Sciences/Clinical Psychiatry.” *Kaplan and Sadock’s Synopsis of Psychiatry: Behavioral Sciences/clinical Psychiatry (11th Ed.)*

Dole, VP, Nyswander, ME and Kreek, MJ. 1966. Narcotic blockade. *Arch Intern Med.* 118(4):304–309.

E. Ware Jr., John. 1987. “Standards for Validating Health Measures: Definition and Content.” *Journal of Chronic Diseases* 40 (6):473–80

EMCDDA | Heroin Profile (Chemistry, Effects, Other Names (Horse, Smack…), Origin/Extraction, Mode of Use, Other Names, Medical Use, Control Status).” n.d. Accessed July 29, 2018.

Fergusson, David M., and Joseph M. Boden. 2008. “Cannabis Use and Later Life Outcomes.” Addiction (Abingdon, England) 103 (6): 969–76; discussion 977-978.

Firoz, A H M, M E Karim, M F Alam, A H M M Rahman, and M M Zaman. 2006. “Prevalence , Medical Care , Awareness and Attitude towards Mental Illness in Bangladesh.” *Bangladesh Journal of Psychiatry* 20 (1): 9–36.

Fischer, JA. 2015. “Beyond Pleasure: A Study into the Quality of Life of Drug Users.” *Pharmacy Australia Centre for Excellence* (PACE), 194.

Fischman, MW. 2001. Amphetamine. *In* De-Wit, RC, Caroll KM, Fagan, J, Kranzler, HR and Kuhar, MJ. (eds). *Encyclopaedia of Drugs, Alcohol and Addictive Behaviour 2nd Edition (Vol. 1).* Macmillan Reference; USA

Foster, J. H., T. J. Peters, and E. J. Marshall. 2000. “Quality of Life Measures and Outcome in Alcohol-Dependent Men and Women.” *Alcohol* 22 (1):45–52

Frisher, Martin, Juliet Collins, David Millson, Ilana Crome, and Peter Croft. 2004. “Prevalence of Comorbid Psychiatric Illness and Substance Misuse in Primary Care in England and Wales.” *Journal of Epidemiology and Community Health* 58 (12):1036–41

Giacomuzzi, SM, Riemer, Y, Ertl, M, et al. 2003. Buprenorphine versus methadone maintenance treatment in an ambulant setting: a health-related quality of life assessment. *Addiction* 98:693–702.

Globe, D, Hays, R, and Cunningham, W. 1999. Associations of clinical parameter with health-related quality of life in hospitalized persons with HIV disease. *AIDS*

Grant, B. F., R. B. Goldstein, S. P. Chou, B. Huang, F. S. Stinson, D. A. Dawson, T. D. Saha, et al. 2009. “Sociodemographic and Psychopathologic Predictors of First Incidence of DSM-IV Substance Use, Mood and Anxiety Disorders: Results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions.” *Molecular Psychiatry* 14 (11):1051–66

Halloran, O, Ifthikharuddin, S, Samkoff, L .2005. "Leukoencephalopathy from "chasing the dragon"". *Neurology* 2005;64:1755.

Hand, C. 2016. “Measuring Health-Related Quality of Life in Adults with Chronic Conditions in Primary Care Settings: Critical Review of Concepts and 3 Tools.” Canadian Family Physician 62 (7):e375–83.

Hill, MD, Cooper, PW, Perry, JR. 2000. "Chasing the dragon--neurological toxicity associated with inhalation of heroin vapour: case report". *CMAJ* 162:236-8.

Hollister, LE. 2001. Bhang. *In* De-Wit, RC, Caroll KM, Fagan, J, Kranzler, HR and Kuhar, MJ. (eds). *Encyclopaedia of Drugs, Alcohol and Addictive Behaviour 2nd Edition (Vol. 1).* Macmillan Reference; USA.

Hser, YI, Evans E, Grella C, Ling W, and Anglin D. 2015. “Long-Term Course of Opioid Addiction.” *Harvard Review of Psychiatry* 23 (2): 76.

Hser, YI, Hoffman, V, Grella, CE, and Anglin, MD. 2001. A 33-year followup of narcotics addicts. *Arch Gen Psychiatry* 58:503–8.

Hwang, HF, Liang, WM, Yun NC, and Mau RL. 2003. “Suitability of the WHOQOL-BREF for Community-Dwelling Older People in Taiwan.” *Age and Ageing* 32 (6): 593–600.

Kardos, J. 1993. The GABA-A receptor channel mediated chloride ion translocation through the plasma membrane: New insights from 36 Cl-ion flux measurements. *Synapse* 13, 74–93.

Kornblum, W, Julian J, and Smith CD. 2003. Social Problems. Oxford University Press (OUP).

Kral, AH, Bluthenthal, RN, Erringer, EA, Lorvick, J, Edlin, BR. 1999. Risk factors among IDUs who give injections to or receive injections from other drug users. Addiction. 94(5):675–683.

Krasnova, IN, Cadet and JL. 2009. "Methamphetamine toxicity and messengers of death". *Brain Res Rev* 60:379-407.

Kreek, MJ, Levran, O, Reed, B, Schlussman, SD, Zhou, Y and Butelman, ER. 2012. “Opiate Addiction and Cocaine Addiction: Underlying Molecular Neurobiology and Genetics.” *The Journal of Clinical Investigation* 122 (10): 3387–93.

Kreek, MJ. 1973. Medical safety and side effects of methadone in tolerant individuals. *JAMA*. 223(6):665–668.

Kreek, MJ. 2000. Methadone-related opioid agonist pharmacotherapy for heroin addiction. History, recent molecular and neurochemical research and future in mainstream medicine. *Ann N Y Acad Sci.*909:186–216.

Lader, MH. 2001. Benzodiazepines: Complications. *In* De-Wit, RC, Caroll KM, Fagan, J, Kranzler, HR and Kuhar, MJ. (eds). *Encyclopaedia of Drugs, Alcohol and Addictive Behaviour 2nd Edition (Vol. 1).* Macmillan Reference; USA

Lasalvia, A, Bonetto, C, Malchiodi, F, et al. 2005. Listening to patients’ needs to improve their subjective quality of life. *Psychol Med* 35:1655– 1665.

Li Y, Xu, W, Metzger, DS, Riedel, E, Montaner, LJ, and Ho, W. 2010. "Upregulation of SOCS-3 and PIAS-3 Impairs IL-12-Mediated Interferon-Gamma Response in CD56+ T Cells in HCV-Infected Heroin Users*". PLoS One* 3:9602.

Lohr, KN. 2002. Assessing health status and quality-of-life instruments: attributes and review criteria. *Qual Life Res*. 11:193–205.

Lugoboni, Fabio, Antonio Mirijello, Marco Faccini, Rebecca Casari, Anthony Cossari, Gessica Musi, Giorgia Bissoli, Gianluca Quaglio, and Giovanni Addolorato. 2014. “Quality of Life in a Cohort of High-Dose Benzodiazepine Dependent Patients.” *Drug and Alcohol Dependence* 142 (September):105–9

McCall, Storrs. 1975. “Quality of Life.” *Social Indicators Research* 2 (2):229–48.

McSweeny, A. John, and Thomas L. Creer. 1995. “Health-Related Quality-of-Life Assessment in Medical Care.” *Disease-a-Month* 41 (1):6–71

Miller, RL. 2002. The encyclopedia of addictive drugs. Greenwood Press, Post Road West: Westport, USA.

Mn, Shazzad, Abdal Sj, Majumder Msm, Sohel Jua, Ali Smm, and S Ahmed. 2013. “Drug Addiction in Bangladesh and Its Effect” 25 (2):84–89

Morales-Manrique, CC, Castellano-Go´mez, M, Valderrama, Zuria´n J and Aleixandre Benavent R. 2006. Quality of life measurement and the importance of attention to self-perceived needs among drug dependent patients. *Transtornos Adictivos* 8:212–221.

Morgan, TJ, Morgenstern, J, Blanchard, K, Labouvie, E and Bux, D 2003. “Health-Related Quality of Life for Adults Participating in Outpatient Substance Abuse Treatment.” *Am J Addict* 12 (3): 198–210.

Novak, SP, and Kral, AH. 2011. “Comparing Injection and Non-Injection Routes of Administration for Heroin, Methamphetamine, and Cocaine Uses in the United States.” *Journal of Addictive Diseases* 30 (3): 248–57.

Novick, DM, Khan, I, Kreek, MJ. 1986. Acquired immunodeficiency syndrome and infection with hepatitis viruses in individuals abusing drugs by injection*. Bull Narc.* 38(1–2):15–25.

Offiah, C, and Hall, E. 2008. "Heroin-induced leukoencephalopathy: characterization using MRI, diffusion-weighted imaging, and MR spectroscopy". *Clinical Radiology* 63:146-52.

Osman CB, Alipah B, Tutiiryani MD, Ainsah O. 2010. Depressive disorder s and family functioning among the caregivers of patients with schizophrenia. *East Asian Arch Psychiatry*, 20(3), 101-8

Rahaman, Razidur. 2014. “Drug Trafficking in South Asia : A Case Study on Bangladesh” 2 (9):178–84.

Revicki, DA, Osoba, D, Fairclough, D, et al. 2000. Recommendations on health-related quality of life research to support labeling and promotional claims in the United States. *Qual Life Res* 9:887–900.

Ross, Helen E., Frederick B. Glaser, and Teresa Germanson. 1988. “The Prevalence of Psychiatric Disorders in Patients With Alcohol and Other Drug Problems.” *Archives of General Psychiatry* 45 (11):1023–31

Ruggeri, M, Gater, R, Bisoffi, G, et al. 2002. Determinants of subjective quality of life in patients attending community-based mental health services. The South- Verona Outcome Project 5. *Acta Psychiatr Scand* 105:131–140.

Sardar, Syed Imran. 2016. “Drug Abuse : Global Vs South Asian Trends With Special Reference To” xxxv (1).

Saurer, TB, ljames, SG and Lysle, DT. 2009. "Evidence for the Nucleus Accumbens as a Neural Substrate of Heroin-Induced Immune Alterations.". *J Pharmacol Exp Ther* 3:1040-1047.

Shazzad, Md Nahiduzzamane, Syed Jamil Abdal, Muhammad Shoaib Momen Majumder, Jahangir ul Alam Sohel, Syed Mohammad Monowar Ali, and Shamim Ahmed. 2014. “Drug Addiction in Bangladesh and Its Effect.” *Medicine Today* 25 (2).

Smith, KW., and Lars, MJ. 2003. “Quality of Life Assessments by Adult Substance Abusers Receiving Publicly Funded Treatment in Massachusetts.” *The American Journal of Drug and Alcohol Abuse* 29 (2): 323–35.

The WHOQOL Group. 1996. “Whoqol-Bref: Introduction , Administration , Scoring and Generic Version of the Assessment.” Programme on Mental Health, no. December:16.

THE WHOQOL GROUP. 1998. “Development of the World Health Organization WHOQOL-BREF Quality of Life Assessment. The WHOQOL Group.” Psychological Medicine 28: 551–58.

Thomas, DL, Shih, JW, Alter, HJ, Vlahov, D, Cohn, S, Hoover, DR, et al. 1996. Effect of human immunodeficiency virus on hepatitis C virus infection among injecting drug users*. J Infect Dis*. 174(4):690–695.

Thrash, B, Thiruchelvan, K, Ahuja, M, Suppiramaniam, V, Dhanasekaran, M. 2009. "Methamphetamine-induced neurotoxicity: the road to Parkinson's disease" (PDF). *Pharmacol Rep* 61:966-77.

Torrance, G W. 1987. “Utility Approach to Measuring Health-Related Quality of Life.” *Journal of Chronic Diseases* 40 (6):593–603

Torrens, M, Domingo-Salvany, A, Alonso, J, et al. 1999. Methadone and quality of life. *Lancet* 353:1101.

Tsutsumi, A, Izutsu, T, Kato, S, Md Akramul Islam, Yamada HS, Kato, H and Wakai, S. 2006. “Reliability and Validity of the Bangla Version of WHOQOL-BREF in an Adult Population in Dhaka, Bangladesh.” *Psychiatry and Clinical Neurosciences* 60 (4): 493–98.

United Nations Office on Drug and Crime.World drug report 2013. Vienna: UNODC, 2013.

United Nations Office on Drugs and Crime. 2017. “World Drug Report, 2017.” Vienna. United Nations publication.

Vederhus, John-Kåre, Are Hugo Pripp, and Thomas Clausen. 2016. “Quality of Life in Patients with Substance Use Disorders Admitted to Detoxification Compared with Those Admitted to Hospitals for Medical Disorders: Follow-Up Results.” Substance Abuse: *Research and Treatment* 10 (May): 31–37.

Williams, JT, Christie, MJ, and Manzoni, O. 2001. “Cellular and Synaptic Adaptations Mediating Opioid Dependence.” *Physiological Reviews* 81 (1): 299–343.

Wong, JG, Cheung, EP, Chen, EY, et al. 2005. An instrument to assess mental

Zorumski, CF and Isenberg, K E. 1991. Insights into the structure and function of GABA-Benzodiazepine receptors: Ion channels and psychiatry. *American Journal of Psychiatry* 148, 162–173.