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Dissertation on

"PSYCHIATRIC CO-MORBIDITY IN PEOPLE WITH HIV/AIDS: A CROSS SECTIONAL STUDY",

SUBMITTED FOR M.D. DEGREE EXAMINATIONS

BRANCH – XVIII

(PSYCHIATRY)

MAY 2019

BONAFIDE CERTIFICATE

This to certify that the Dissertation entitled "**PSYCHIATRIC CO-MORBIDITY IN PEOPLE WITH HIV/AIDS: A CROSS SECTIONAL STUDY**", is a bonafide record of work done by **Dr.V. Vijayakumar,** in the department of Psychiatry, Government Kilpauk Medical College, Chennai, during her Post Graduate Course from 2016 to 2019. This is submitted as partial fulfilment for the requirement of M.D. Degree examinations – Branch – XVIII (Psychiatry) to be held in **May 2019**.

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DECLARATION

I, **Dr. V. Vijayakumar,** solemnly declare that the dissertation titled "**PSYCHIATRIC CO-MORBIDITY IN PEOPLE WITH HIV/AIDS: A CROSS SECTIONAL STUDY**" is a bonafide work done by me in Government Kilpauk Medical College, Chennai, during March 2018 – August 2018 under the guidance and supervision of Professor **Dr M. Malaiappan, MD (Psychiatry)**.

This dissertation is submitted to "**The Tamilnadu Dr M.G.R. Medical University, Chennai**", Tamilnadu as a partial fulfillment for the requirement of **M.D.** Degree examinations – Branch – XVIII (Psychiatry) to be held in **May 2019.**

(DR. V. Vijayakumar)

Place: Chennai

Date:

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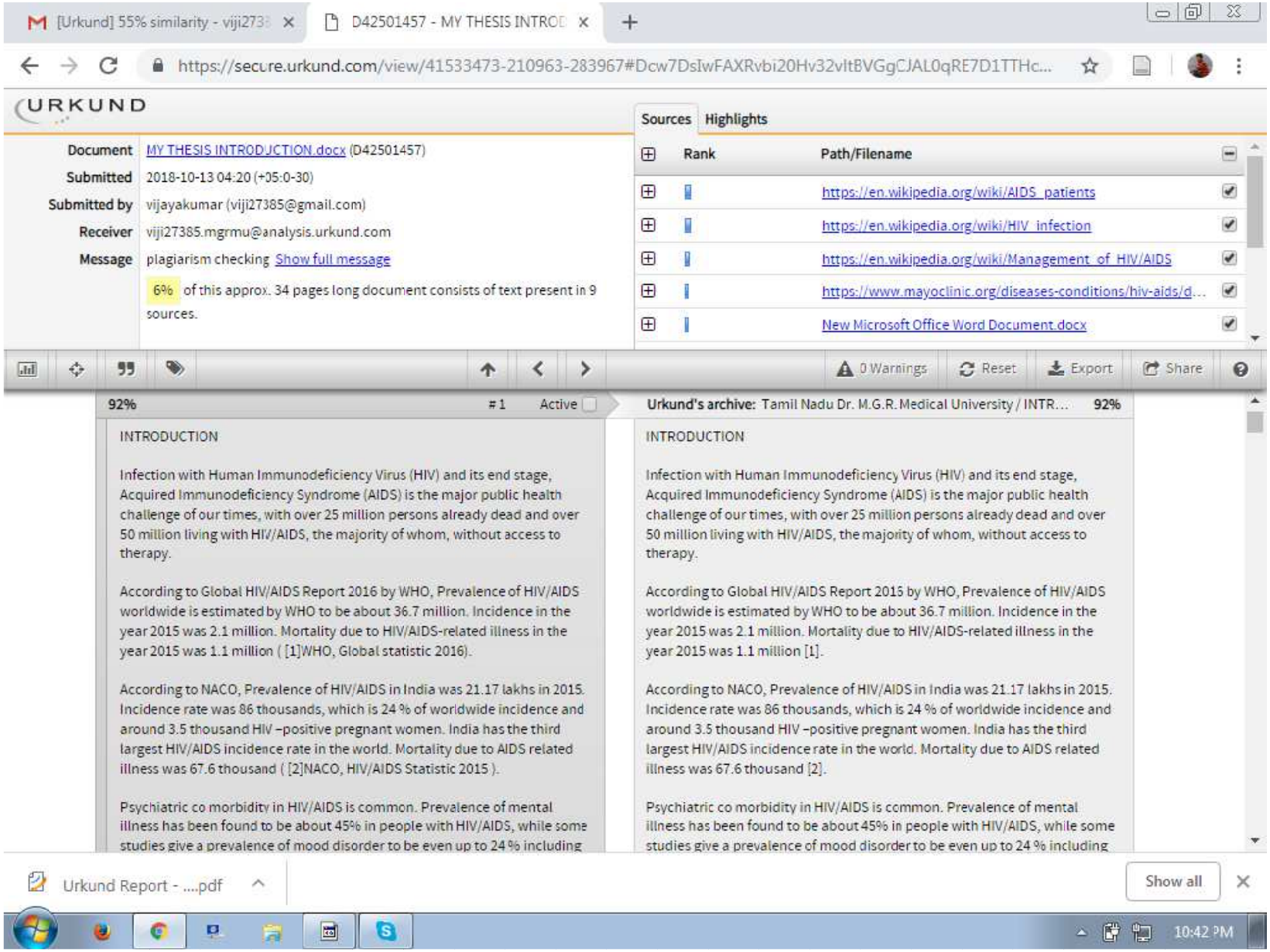
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INTRODUCTION
Infection with Human Immunodeficiency Virus (HIV) and its end stage, Acquired Immunodeficiency Syndrome (AIDS) is the major public health challenge of our times, with over 25 million persons already dead and over 50 million living with HIV/AIDS, the majority of whom, without access to therapy.
According to Global HIV/AIDS Report 2016 by WHO, Prevalence of HIV/AIDS worldwide is estimated by WHO to be about 36.7 million. Incidence in the year 2015 was 2.1 million. Mortality due to HIV/AIDS-related illness in the year 2015 was 1.1 million ([1]WHO, Global statistic 2016).
According to NACO, Prevalence of HIV/AIDS in India was 21.17 lakhs in 2015. Incidence rate was 86 thousands, which is 24 % of worldwide incidence and around 3.5 thousand HIV –positive pregnant women. India has the third largest HIV/AIDS incidence rate in the world. Mortality due to AIDS related illness was 67.6 thousand ([2]NACO, HIV/AIDS Statistic 2015).
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CONTENTS

ABBREVIATIONS

ADS	:	Alcohol Dependence Syndrome
AIDS	:	Acquired Immunodeficiency syndrome
ART	:	Anti Retroviral Therapy
AUDIT	:	Alcohol Use Disorder Identification Test
DM	:	Diabetes Mellitus
FTND	:	Fagerstrom Test for Nicotine Dependence
HAM-A	:	Hamilton rating scale for Anxiety
HAM-D	:	Hamilton rating scale for Depression
HIV	:	Human Immunodeficiency Virus
ICD	:	International Classification of Disease
KPS	:	Karnofsky Performance Status Scale
MDD	:	Major Depressive Disorder
MMAS	:	Morisky's Medication Adherence Scale
MOCA	:	Montreal Cognitive Assessment
MSPSS	:	Multidimensional Scale of Perceived Social Support
NACO	:	National AIDS Control Organisation
NDS	:	Nicotine Dependence Syndrome
TB	:	Tuberculosis
WHO	:	World Health Organisation

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Psychiatric co morbidity in HIV/AIDS is common. Prevalence of mental illness has been found to be about 45% in people with HIV/AIDS, while some studies give a prevalence of mood disorder to be even up to 24 % including major depressive disorder 19% and adjustment disorder 7%, anxiety disorder 1 %,substance use disorders 17% and psychotic disorder 1 % ([3]Naresh

Nebhinanai et al,2011). During the course of illness, upto 85% of HIV – seropositive individuals report some depressive symptoms and upto 50% experience major depressive disorder ([4]J.Hampton Alkinson et al, 2018)**.** Psychiatric co morbidity and substance abuse in HIV/AIDS have been associated with poor compliance, negative outcome of HIV, defaulter, resistance, destructive forms of HIV, greater HIV transmission, greater mortality and adverse drug reactions. 10% of HIV/AIDS estimated to be due to alcohol ([5]David J.Dausey et al, 2003). Psychopathology may have impact on treatment adherence, quality of life, social and adaptive functioning and possibly HIV – illness progression **(**[6]Robinson and Quaqish 2002**).** Neuropsychiatric phenomena occurring during the course of HIV infection and AIDS can broadly be considered under neurobiological, psychobiological and psychosocial aspects.

In a meta analysis of published studies, [7]Ciesla and Robert (2001) found that people with HIV were almost twice as likely as those who are HIV – Seronegative to be diagnosed with major depressive disorder and that depression was equally prevalent in people with both symptomatic and asymptomatic HIV. Life time prevalence rates of anxiety disorders are higher in the HIV clinical population as a whole than in the general population ([8]Blalock et al 2005). Initial symptoms of HIV infection are neuropsychological in 10% to 30% of cases ([9]Lezak – 1995). These phenomena can be the result of direct infection of the central nervous system

with HIV, opportunistic infections that occur in the central nervous system, individual psychological reactions to HIV disease and its consequences, the social implications of the disease and side effects of medications taken to manage the disease

NEED OF STUDY:

Psychiatric co morbidity in HIV/AIDS is an important factor in determining the course and outcome of HIV/AIDS and is associated with treatment follow-up factors like defaulting and poor compliance. It becomes important to assess the prevalence and severity of psychiatric disorders in people with HIV/AIDS and its association with various sociodemographic factors and disease related factors. Proper identification and treatment of psychiatric co morbidity will help improve patient adherence and quality of life and illness outcome in HIV/AIDS.

AIMS AND OBJECTIVES

AIM

- To assess the prevalence of psychiatric illnesses in people undergoing treatment for HIV/AIDS.

OBJECTIVES

- To assess the association between psychiatric co morbidity and different sociodemographic factors (age, gender, education) and disease related factors (duration of illness, stages of HIV/AIDS, CD4 count, HIV-TB and other co infections and other opportunistic infections)
- To assess the relationship between psychiatric co morbidity and treatment follow-up factors like poor adherence and history of defaulting.
- To assess the support systems, functional level in relation to psychiatric illness.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

Human immunodeficiency virus infection, and acquired immune deficiency syndrome (HIV/AIDS) is a range of conditions caused by infection with the human immunodeficiency virus (HIV).[10] HIV is spread mainly by unprotected sexual intercourse, HIV infected blood transfusions, HIV contaminated needles, and from mother to child through pregnancy, delivery, or breastfeeding.[11]., Following early infection, a person might not notice any symptoms or might experience a short period of influenza-like illness. Usually, this is followed by a prolonged period with no symptoms. As the infection progresses, it interferes with the immune system, increasing the risk of developing common opportunistic infections such as tuberculosis, as well as other infections, and tumors that may rarely affect people who have working immune systems.[12] These late stages of infection are referred to as acquired immunodeficiency syndrome (AIDS). This stage is often also associated with unexplained weight loss.[13]

AIDS was first recognized in the US in 1981 with reports of unexplained opportunistic infections, including Pneumocystis jirovecii (formerly Pneumocystis carinii), pneumonia and Kaposi's Sarcoma (KS) among homosexual men in New York and San Francisco ([14]Cleghorn, Reitzfr, and Gallo; 2000).

The first case of HIV infection in India was diagnosed among commercial sex workers in Chennai, Tamil Nadu, 1986.

HIV / AIDS is a major public health problem all over the world. The overwhelming majority of HIV infected people, more than 90%, live in the developing world and most of them do not even know that they are infected.

This epidemic killed about 3 million people all over the world in the year 2004. Globally more than 40 million people are infected with HIV ([15]Training Module on continuum of care for health care provider 2005 TNAIDS control society).

HIV is a retrovirus that primarily infects components of the human immune system such as $CD4^-$ T cells, macrophages and dendritic cells. It directly and indirectly kills $CD4^-$ T cells. HIV is a belongs to genus Lentivirus. HIV is transmitted as single-stranded, positive-sense, enveloped RNA virus. After enters into the target cell, the viral RNA genome is converted into double-stranded DNA by a virally encoded reverse transcriptase that has transported along with the viral genome in the virus particle. The resulting viral DNA is then enters into the cell nucleus and integrated into the cellular DNA by a virally encoded integrase and host co-factors. After entered, the virus may become latent, allowing the virus and its host cell to stay away from detection by the immune system. Meanwhile, the virus might be transcribed, producing

new RNA genomes and viral proteins that are packaged and released from the cell as new virus particles that begin the replication cycle. [16]

HIV is identified to spread between CD4 T cells by two parallel routes: cell-free spread and cell-to-cell spread. In the cell-free spread, virus particles comes from an infected T cell, enter the extracellular fluid and then infect another T cell following a chance encounter. [17] . HIV may also spread by direct transmission from one cell to another by a process of cell-to-cell spread. [18]. These peculiar spreading mechanisms of HIV contribute to the virus's ongoing replication against antiretroviral therapies. [19]

TYPES OF HIV

It has two types: Human ImmunodeficiencyVirus-1 and Human Immunodeficiency Virus-2. HIV-1 is the virus that was first discovered. It is highly infective and more virulent, and is the cause of the majority of HIV infections globally[20]. Compared with HIV-1, HIV-2 has low infectivity implies that only minor number of people exposed to HIV-2 will be infected per exposure. Because of its relatively reduced level of capacity for transmission, HIV-2 is largely confined to West part of Africa. [21]

MODE OF TRANSMISSION

HIV is present in blood, semen, cervical and vaginal secretions and to a lesser extent in saliva, tears, breast milk and the cerebrospinal fluid of those

who are infected (Sadock and Sadock, 2003)[22]. The modes of transmission include heterosexual and homosexual contact, vertical transmission, and instrumental transmission, which involves introduction of HIV – contaminated fluids or materials into the body by means of needles, blood products or various medical accidents. Receptive fellatio involving ejaculation of HIV – infected semen is another potential mode, but the actual risk is not known. Kissing is not considered a risk unless there is extensive oral disease with open sores. Worldwide, the sexual mode of transmission is the most important (Sadock & Sadock, 2000)[23].

The chance of becoming infected after a single exposure is relatively low : 0.8 to 3.2% in unprotected receptive anal intercourse, 0.05 to 0.15% with unprotected vaginal sex, 0.32% after puncture with an HIV – contaminated needle and 0.67% after using a contaminated needle to inject drugs.

WINDOW PERIOD

The window period is time between exposure to HIV infection and the point when the test will give an accurate result**.** During the period a person can be infected with HIV and be very infectious but still test HIV negative. The window period for a 4th generation antigen/antibody test is four weeks. At this time 95% of infections will be detected . There is a three month window period after exposure to HIV infection, for the confirmatory result to detect more than 99.9% of infections.

DIAGNOSIS OF HIV INFECTION

HIV tests are commonly used to detect the presence of the human immunodeficiency virus (HIV), in serum, saliva, or urine. The standard screening test for HIV infection is the detection of anti-HIV antibodies using an enzyme immunoassay (EIA). This test is highly sensitive (>99.5%) and is quite specific. Most commercial EIA kits are able to detect antibodies to both HIV-1 and 2 and many also detect the HIV core antigen p24. The Western blot detects antibodies to HIV antigens of specific molecular weights. Antibodies to HIV begin to appear within 2 weeks of infection, and the period of time between initial infection and the development of detectable antibodies is rarely >3 months. Plasma p24 antigen levels rise during the first few weeks following infection, prior to the appearance of anti-HIV antibodies.

HIV can be cultured directly from tissue, peripheral blood cells, or plasma, but this is most commonly done in a research setting. HIV genetic material can be detected using reverse transcriptase PCR (RT-PCR), branched DNA (bDNA), or nucleic acid sequence–based assay (NASBA). These tests are useful in pts with a positive or indeterminate EIA and an indeterminate Western blot. They turn positive early in infection and will usually be positive in pts in whom serologic testing may be unreliable (such as those with hypo gammaglobulinemia).

Antigen/antibody combination tests - A combination, or 4th generation assay, is designed to detect both the p24 antigen and HIV antibodies in a single test. Combination tests can detect HIV as early as 2–6 weeks after infection,and are recommended in laboratory testing.[24](Harrison, 2016)

STAGES OF HIV/AIDS

The WHO clinical staging of HIV/AIDS for HIV- infected adults and adolescents into one of four hierarchical clinical stages ranging from stage 1 (asymptomatic) to stage 4 (AIDS). Patients are assigned to a particular stage when they demonstrate at least one clinical condition in that stage's criteria. Patients remain at a higher stage after they recover from the clinical condition which placed them in that stage .

Stage 1: Patients who are asymptomatic or have persistent generalized lymphadenopathy (lymphadenopathy of at least two sites [not including inguinal] for longer than 6 months) are categorized as being in stage 1, where they may remain for several years .

Stage 2: Even in early HIV infection, patients may demonstrate several clinical manifestations. Clinical findings included in stage 2 (mildly symptomatic stage) are unexplained moderate weight loss of less than 10 percent of total body weight and recurrent respiratory tract infections (such as sinusitis, tonsillitis, bronchitis, otitis media, and pharyngitis), as well as a range of dermatological conditions including herpes zoster , angular cheilitis,

recurrent oral ulcerations, papular pruritic eruptions, seborrhoeic dermatitis, and fungal nail infections .

Stage 3 : As disease progresses, additional clinical manifestations may appear. Those encompassed by the WHO clinical stage 3 (the moderately symptomatic stage) category are severe weight loss of greater than 10 percent of total body weight, chronic (more than 1 month) unexplained diarrhea, pulmonary tuberculosis, unexplained persistent fever (above 37.5 C intermittent or constant for longer than one month) and severe systemic bacterial infections including pneumonia, pyelonephritis, empyema, pyomyositis, meningitis, bone and joint infections, and bacteremia. Mucocutaneous conditions, including recurrent oral candidiasis, oral hairy leukoplakia, and acute necrotizing ulcerative stomatitis, gingivitis, or periodontitis, and unexplained anemia (less than 8g/dl), neutropenia (less than 0.5×10^9/l) and or chronic thrombocytopenia (less than 50×10^9/l) may also occur at this stage .

Stage 4: The WHO clinical stage 4 (the severely symptomatic stage) which includes all of the AIDS-defining illnesses. Clinical manifestations for stage 4 disease will allow presumptive diagnosis of AIDS to be made based on clinical findings alone are HIV wasting syndrome, Pneumocystis pneumonia (PCP), recurrent severe bacterial pneumonia, extrapulmonary tuberculosis, HIV encephalopathy, CNS toxoplasmosis, chronic (more than 1

month) or orolabial herpes simplex infection, esophageal candidiasis, and Kaposi's sarcoma . Other conditions that should arouse suspicion that a patient is in clinical stage include cytomegaloviral (CMV) infections (CMV retinitis or infection of organs other than the liver, spleen or lymph nodes), extrapulmonary cryptococcosis, disseminated endemic mycoses (e.g., coccidiomycosis, penicilliosis, histoplasmosis), cryptosporidiosis, isosporiasis, disseminated non-tuberculous mycobacteria infection, tracheal, bronchial or pulmonary candida infection, visceral herpes simplex infection, acquired HIV-associated rectal fistula, cerebral or B cell non-Hodgkin lymphoma, progressive multifocal leukoencephalopathy (PML), and HIV-associated cardiomyopathy or nephropathy . Presence of these conditions unaccompanied by the AIDS-defining illnesses, however, should prompt confirmatory testing.[25] (WHO clinical staging, Jennifer L.weinberg et al, 2010)

TESTS TO STAGE DISEASE OF HIV/AIDS

There are several tests used to determine the stage of HIV/AIDS. These tests include:

- **CD4 T cell count:** CD4 T cells are white blood cells that are specifically targeted and destroyed by HIV. Even patient have no symptoms, HIV infection progresses to AIDS when your CD4 T cell count dips below 200.

- **Viral load (HIV RNA).** This test measures the amount of virus in patient blood. A higher viral load has been linked to a worse outcome.

- **Drug resistance.** Some strains of HIV are resistant to medications. This test helps to determine if patient specific form of the virus has resistance and guides treatment decisions.

MANAGEMENT OF HIV/AIDS

The treatment of HIV/AIDS typically includes the use of multiple antiretroviral drugs in an attempt to control HIV infection. There are numerous classes of antiretroviral agents that act on different stages of the HIV life-cycle. The use of several antiretroviral drugs that act on different HIV viral targets is known as highly active antiretroviral therapy (HAART). HAART decreases the patient's overall burden of HIV, maintains function of the immune system, and prevents many HIV opportunistic infections that often lead to death.[26]

There are many classes (mainly six classes) of ARV drugs, which are commonly used in combination, to treat HIV infection. Antiretroviral (ARV) drugs are generally classified by the stage of the retrovirus life-cycle that the drug inhibits. Usual combinations include two Nucleoside reverse transcriptase inhibitors (NRTI) along with one Non-Nucleoside reverse transcriptase inhibitor (NNRTI), protease inhibitor (PI) or Integrase inhibitors [27].

ENTRY INHIBITORS OR FUSION INHIBITORS:

Its mainly interfere with binding, fusion and entry of HIV to the host cell by blocking one of numerous targets. Maraviroc and Enfuvirtide are the example currently available in this class.

NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS AND NUCLEOTIDE REVERSE TRANSCRIPTASE INHIBITORS:

These drugs mainly inhibit reverse transcription. Examples of mainly used NRTIs include zidovudine, lamivudine, abacavir, emtricitabine, and tenofovir. (Eddy Arnoid,et al,2013). Non-nucleoside reverse transcriptase inhibitors (NNRTI) mainly inhibit reverse transcriptase by binding to an allosteric position of the enzyme; NNRTIs act as non-competitive inhibitors of reverse transcriptase. NNRTIs can be additionaly classified into first generation and second generation NNRTIs. 1st generation NNRTIs include nevirapine and efavirenz. 2nd generation NNRTIs are etravirine and rilpivirine.[28], [29].

INTEGRASE INHIBITORS:

It also called as integrase nuclear strand transfer inhibitors or INSTIs and its mainly inhibit the viral enzyme integrase, which is accountable for integration of viral DNA into the DNA of the infected cell. Example of integrase inhibitors are elvitegravir and dolutegravir [30].

PROTEASE INHIBITORS:

It inhibits the viral protease enzyme which is necessary to produce mature virions upon budding from the host membrane. predominantly, these drugs prevent the cleavage of gag and gag/pol precursor proteins[31]. Examples are lopinavir, ritonavir, indinavir, nelfinavir, and amprenavir.

THE INTERACTION OF PHYSICAL AND PSYCHIATRIC MORBIDITIES:

Psychiatric and physical diseases or disorders can influence each other through many mechanisms. One is through direct actions on physiological systems like neuroendocrine and immune systems. Another is through health behaviour. Patients with chronic diseases have multiple burdens like pain, reduced quality of life, premature death, financial costs and emotional trauma to the family members. Mood disorder has a lifetime prevalence of 8.9% to 12.9% and a six month prevalence of 5.8% to 9.4% in chronic diseases. About 20% of patients with physical disease suffer from major depression. It is a known fact that, sometimes, it may be difficult to determine if a somatic symptom is associated with the physical illness or the psychiatric illness[32] (Lustman, P. J. 1995, Lustman, P. J. 2000, DiMatteo, M. R. 2000).

Adherence rate for long term medications is estimated to be about 50%. That is, about half of patients supposed to take drugs on term for physical illnesses, stop taking them. Depression has an important role in this behaviour.

Studies have found that depression is associated with poor adherence rate with medications for physical illnesses. Patients with depression were found to be three times more likely to have poor adherence than those without depression. Moreover, treatment of depression and anxiety in patients with physical illness can lead to better outcomes regarding their physical illness. This has been observed in patients with diabetes in various studies. Substance use has also been associated with poor compliance with treatment[34] (Doherty, A. M., 2013).

PSYCHIATRIC ASPECTS OF HIV INFECTION AND AIDS

Neuropsychiatric phenomena occurring during the course of HIV infection and AIDS can broadly be considered under neurobiological, psychobiological and psychosocial aspects. These phenomena can be the result of direct infection of the central nervous system with HIV, opportunistic infections that occur in the central nervous system, individual psychological reactions to HIV disease and its consequences, the social implications of the disease and side effects of medications taken to manage the disease. Thus, the broad range of mental health problems associated with HIV infection includes not only understandable emotional reactions to the illness, but also frank psychiatric disorders and neuropsychiatric syndromes.

Research has been carried out on the psychological status of people with HIV infection, including those at different stages of the illness, such as at the time of HIV testing, during asymptomatic and symptomatic stages of the illness. Notification of a positive test result is usually associated with severe, if transient, distress. Common diagnosis given to asymptomatic individuals referred to mental health services are adjustment disorder, major depression and other forms of depression, substance misuse, panic disorder and personality problems. A large number of symptomatic HIV patients present with depression [35],[36](Perry and Tross, 1984; Dilley et al, 1985), while other common diagnosis in this group includes organic brain syndromes.

A number of studies have assessed the prevalence of psychiatric disorders in HIV positive patients[37],[38],[39],[40] (Seth 1991; Faulstich 1987; Maj 1994). King et al (1989)[41] reported that 31% of a sample of 192 outpatients with HIV infection and AIDS had significant psychiatric problems. In a study done by[42] Lykestos et al (1994) on HIV positive patients attending a medical outpatient clinic, 54% had a psychiatric disorder, with an additional 22% diagnosed with substance use disorder. Lluch et al, on evaluating psychopathology in an inpatient sample of 25 AIDS patients, found that 80% had a psychiatric diagnosis, of which, the greatest number showed depressive symptoms. A study done in Spain by Ayuso et al [43](1996) on AIDS patients detected psychoactive substance use to be the principal diagnosis followed by adjustment disorder. As most available studies had been done on western

populations, the WHO in 1994 implemented a cross-cultural venture called the WHO Neuropsychiatric AIDS study. The overall prevalence of current mental disorder was significantly higher in seropositive compared to seronegative patients in two of the five centers in the study. Probably one of the first reported studies on psychiatric morbidity in HIV infected individuals in India, by Jacob et al,[44] documented an overall psychiatric morbidity of 26.1 %.

Some other studies done by Atkinson et al (1988)[45] and Williams et al (1991) [46] did not find a significant difference between HIV positive and negative controls with respect to prevalence of psychiatric morbidity.

Factors associated with the development of psychiatric disorders in HIV positive individuals have been studied:

HIV related factors - mental health symptoms are more likely to occur at two stages; i.e., when the person is given a diagnosis of HIV infection and when physical symptoms develop or worsen[47],[48] (Davis et al 1995; Holt et al 1998).

Personality factors - there is some evidence to show that people with personality disorders, in particular those with borderline or antisocial personality disorder are at a greater risk of acquiring HIV infection [49],[50](Johnson et al 1996; Golding & Perkins 1996). It is suggested that people with personality disorders have less effective coping styles.

Past psychiatric history- person with psychiatric distress has high vulnerability to Infection with HIV [51],[52] (Dew et al, 1990; Catalan et al, 1992).

Social support - individuals lacking in adequate social support usually report greater levels of psychological distress[53] (Catalan et al, 1995; Katz et al 1996)

Adverse life events - multiple bereavements, loss of supports, survivor's guilt and concerns about one's own health can conspire to make what is already a difficult situation, extremely hard to cope with, leading to unresolved and complex grief reactions [54],[55](Sherr et al, 1995; Fishman and Perry, 1989).

Sociodemographic characteristics - Older individuals may be at a greater risk for cognitive impairment and dementia (Catalan et al, 1995). Injecting drug users have the poorest psychological status, often having experienced social and psychological difficulties prior to acquiring the infection[56] (Gala et al, 1993).

PSYCHIATRIC DISORDERS AND HIV

ACUTE STRESS REACTIONS

Psychological reactions to the diagnosis of HIV infection resemble those commonly described in response to the diagnosis of cancer or other life threatening diseases. However, in view of the specific psychosocial dimensions relevant to HIV, subjects receiving the diagnosis are suddenly confronted not

only with the likelihood of developing a disease with a very poor prognosis, but also with various other issues: revealing their homosexuality / drug abuse to family, friends and colleagues; dealing with the fear of partners, friends and public; avoiding transmitting the infection to others and protecting themselves from opportunistic infection[57],[58] (Christ et al, 1988; Miller 1988). For all the above reasons, it is not surprising that acute stress reactions have been reported in upto 90% of subjects with a recent diagnosis of HIV (WHO, 1988).

Acute stress reaction may occur in any phase of the infection, with various changes in the person's clinical state. However, it is most common immediately after the diagnosis. It has also been found to occur most frequently in subjects lacking a partner or living in a rural environment according to reports from Germany [59](Seidl & Goebel, 1987), and also to be more common in homosexuals. Apart from clinical features of confusion, bewilderment, derealization and sleep disturbances are noted initially following the diagnosis; other emotional and behavioural reactions may include anger, withdrawal, guilt, denial, fear, despair[60],[36],[61] (Morin et al, 1984; Dilley et al 1985, Miller 1995). Management focuses primarily on preventive measures such as pretest and post test counseling.

ADJUSTMENT DISORDERS

This is characterized by a morbid (that is excessive in length and/or intensity) response to the diagnosis of HIV infection or AIDS, or more generally to the stress associated with the disease. The clinical features may be characterized by depression, anxiety or obsessions and compulsions, and the disorder may last many months (WHO, 1988). Adjustment disorder has been reported to be the most frequent diagnosis in patient's with ARC or AIDS referred for psychiatric consultation[36],[62],[63],[64] (Dilley et al, 1985; Tross et al, 1986; Rundell et al, 1988; Schaerf et al 1989).

The disorder can be conditioned by several factors: subject's coping strategies[65] (Namir et al, 1(87), subjects who have internalized social non acceptance of drug abuse or homosexuality leading to feelings of guilt and self depreciation[66],[58] (Hays & Lyles, 1986; Miller, 1988), previous history of psychiatric disorders[62] (Holland & Tross, 1985), family estrangement[58] (Miller 1988), over concern over the impact of the illness on loved ones, financial difficulties, and poor social support[67] (Zich and Temoshok 1987).

Management involves behavioural and cognitive psychotherapy on an individual or group basis, involving partners or family members as patients judge appropriate [58](Miller, 1988). Pharmacological treatment of depressive or anxiety symptoms may be required.

MOOD DISORDERS

1) DEPRESSIVE SYNDROMES:

A depressive syndrome not fulfilling the ICD-10 or DSM- IV criteria for depressive episode may occur at any point in the course of HIV infection (WHO, 1988). Major depressive disorder has been reported in subjects with HIV infection but estimates concerning its prevalence have been quite divergent. In a study of admitted AIDS patients done by Perry and Tross (1984)[35], 82.7% showed mood disturbance with 17.3% fulfilling criteria for major depressive disorder. In hospitalized patients, this rate may be higher and approach 40%. Rundell et al (1988)[63] after reviewing records of 111 HIV positive subjects seen at a Medical Air Force Centre in Texas, found major depressive disorder in 3.6% of the sample. Schaerf et al (1989)[64] found a prevalence of 7% in a sample of AIDS patients, which was comparatively less than the prevalence of depressive disorders in a sample of general hospital consultations. Similar low rates of current major depression in men with AIDS was reported by Rabkin et al 1997[68], who found overall rates of 5-10% with no significant difference between HIV negative men, HIV positive men without AIDS and men with AIDS defining conditions.

Inspite of these studies, others have reported rates of current major depression in HIV populations elevated two folds above those in healthy community samples and usually in the range found with other chronic medical illnesses [45](Atkinson et al 1988, Perry) 1990, [46]William et al, 1991**.** In

view of these vastly differing results Jeffrey Ciesla (2001)[69] conducted a meta-analysis of 10 studies conducted from 1988 to 1998, which compared the rates of current major depression between HIV positive and HIV negative groups. Though most of these studies concluded that the infection was not associated with a higher rate of the disorder, the results of the meta-analysis showed that the frequency of major depressive disorder was nearly 2 times higher in HIV positive than HIV negative persons with no relation to sexual orientation or disease stage.

The relationship between depression and disease progression in HIV has also been studied. A 10 year multicentre AIDS Cohort study by Lykestos et al (1996)[70], showed a dramatic sustained rise in depressive symptoms as AIDS develops, with prior depression, HIV disease related factors and psychiatric stressors contributing to this risk.

Major depressive disorder in HIV may be interpreted in several ways:

- It may result from psychosocial problems related to the illness.
- May be directly related to HIV infection of the brain, in particular the predilection of the Virus for limbic areas, believed to control emotional experience.
- Predisposing factors in a vulnerable subject.
- From chance association.

- May result from secondary effects of the infection i.e., opportunistic infections or neoplasms [35](Perry & Tross, 1984), or use of antineoplastic drugs [71](Volberding et al 1985).

It is important to emphasize that depressive symptoms may be difficult to differentiate from some manifestations of AIDS Related Complex (fatigue, anorexia, weight loss, decreased libido) or of dementia (decreased memory and concentration).

2) MANIC SYNDROMES

A few cases of hypomania or mania in subjects with HIV infection have also been described. The possible interpretations are similar to those proposed for acute psychotic disorder, with mania occurring either in the context of cognitive impairment[72],[73],[58] (Gabel et al 1986: Schmidt & Miller, 1988), or in the absence of cognitive impairment [73],[74](Schmidt & Miller 1988; Buhrich et al, 1988).

ANXIETY DISORDERS

Symptoms of anxiety determined by self report checklist tend to be higher in medically asymptomatic HIV positive patients than HIV negative at-risk samples [75](Atkinson et al, 1989). But other studies have reported that anxiety disorders may be common in groups at high risk for HIV infection, irrespective of HIV status[76],[77] (Baer 1989; Perry 1990). Six month prevalence rates of generalized anxiety disorder in HIV positive men are in the ranges of 15-20 percent [78](Atkinson & Grant 1994). Rates of other anxiety

disorders do not appear to be markedly elevated [79],[77](William, 1991; Perry 1990). Simple phobias and hypoactive sexual desire disorder have been reported[80] (Rundell & Brown 1990).

ACUTE PSYCHOTIC DISORDERS

With evidence of cognitive impairment

Hallucinations (either visual or auditory) and delusions (either persecutory or grandiose) are not infrequent in patients with ARC or AIDS. They may occur in the context of cognitive impairment which may sometimes be subtle or fluctuating [81],[80],[82](Nurnberg et al, 1984; Rundell, 1990; Thomas & Szabadi, 1987) or they may be initially the only psychopathological manifestation.

Without evidence of cognitive impairment

Patients with asymptomatic HIV infection, AIDS Related Complex or AIDS, who developed acute psychotic disorders without any evidence of cognitive impairment throughout the episode, have been reported[83],[84],[74] (Thomas et al, 1985; Halevie-Goldman et al, 1987: Buhrich et al 1988). The interpretation for this has already been outlined under manic disorders. A specific vulnerability of dopaminergic systems in AIDS has been suggested by [85]Holland et al (1985). The predilection of HIV for the limbic system has also been discussed in connection with a case of catatonia in a HIV positive subject in whom PET scan showed increased blood flow in the right temporal cortex and basal ganglia[86] (Volkow et al, 1987).

Though there have been numerous case reports of psychosis in HIV infection and AIDS with estimated rates of 0.1 to 5% [87],[88],[74](Sewell et al, 1994; Harris et al 1991; Buhrich 1988), accurate estimates of incidence and prevalence as compared to the general population is completely unknown[89] (Maj 1990). Treatment interventions studied in this group have found the response to neuroleptics to be favourable, but AIDS patients are highly susceptible to the extrapyramidal side effects of antipsychotic drugs.

HIV DEMENTIA

The HIV virus being highly neurotrophic, neuropsychological abnormalities are commonly present in HIV infected individuals. Clinically apparent central nervous system disease occurs in at least 20-40% of AIDS patients[90] (Wolcott et al 1989).

HIV dementia is currently believed to be caused by the infection of the brain with HIV [91](Navia et al, 1986). The onset is usually insidious. Early symptoms can be subdivided into three groups: cognitive, behavioural and motor[91],[92] (Navia et al, 1986; Price et al 1988). Behavioural symptoms include apathy, reduced spontaneity and social withdrawal. Depression, irritability, emotional lability, agitation and psychotic symptoms can rarely occur. Estimates of the prevalence of HIV dementia varies according to the sample studied, the stage of illness and the criteria used for diagnosis. Janssen et al (1989) [93]reported that of the adults in his study, 6.5% had HIV dementia, and 3.0% were reported to have it as the only early manifestation of

AIDS. Previous estimates of the point prevalence of HIV dementia in AIDS patients ranged from 8-16% (WHO 1988).

As expected, the prevalence is found to be much higher in autopsy series of cases reported to neurologists, reaching the figure of 66% [92](Price et al, 1988). Neurological abnormalities have been reported in a substantial proportion of symptomatic HIV positive subjects, not showing the clinical picture of HIV dementia. Neurocognitive impairment in the asymptomatic phase of HIV infection remains controversial [94](Grant et al 1989).

DELIRIUM

Delirium has been described both in relation to HIV dementia[92] (Price et al, 1988) and to the aseptic meningitis which may occur following infection. Its occurrence in AIDS patients may be related to hypoxia (from Pneumocystis carinii pneumonia) Cryptococcus meningitis, systemic infections, space occupying lesions of the brain (CNS lymphoma or brain abscesses due to toxoplasmosis), metabolic impairments and the use of psychotropic medications (especially tricyclic antidepressants, whose central anticholinergic activity seems to be more pronounced in such patients).

The syndrome usually develops over a short period of time (hours to days) with fluctuations in intensity over the course of a day. Complete recovery of delirium usually occurs at the time of seroconversion, but delirium superimposed on HIV dementia may aggravate its course [92](Price et al 1988).

Available estimates of the prevalence and incidence of HIV delirium in HIV infection are lacking.

SUBSTANCE USE DISORDERS

Groups at highest risk for HIV infection also commonly have substance use disorders and alcohol dependence[45],[76] (Atkinson et al, 1988; Baer 1989). Though many alcoholics have a chronic history of substance use, alcohol use disorders may occur in some individuals due to the stress of the disease and physical disability.

PERSONALITY DISORDERS

Perkins et al (1993)[95] assessed personality disorders in a HIV positive population and found the prevalence to be fairly high. Patients with personality disorders may experience greater dysphoria and are more likely to cope with the threat of AIDS in a dysfunctional way.

OTHER AIDS RELATED PSYCHOPATHOLOGY

Delusions - It is well known that psychotic patients tend to incorporate in their delusions, topics that are of public interest. Several authors have described delusions of having contracted AIDS in patients suffering from psychotic depression, schizoaffective disorder or paranoid schizophrenia[96], [97],[98] (Rapaport & Braff, 1988; O'Brien, 1987; Shetty, 1988) with the most frequent occurrence in psychotic depression.

Suicidal attempts by contracting AIDS[98],[99] (Francis et al 1985: Flavin et al 1986) – Highest risk in homosexual men who are depressed or alcoholic.

Factitious AIDS [100](Miller et ~ 1986)

AIDS RELATED PSYCHOPATHOLOGY IN SUBJECTS WITHOUT HIV INFECTION

Hypochondriacal syndrome (the 'worried well') a syndrome marked by the persistent belief in the presence of HIV infection despite repeated negative serological tests and clinical examinations has been described by various authors[101],[58] (Forstein, 1984; Miller, 1988).

HIV AND TUBERCULOSIS:

HIV is one of the risk factors for developing tuberculosis. HIV/AIDS by itself is estimated to have lowered economic growth and reduced life expectancy by up to 50% in some countries. TB-HIV co-infection has been found to have a greater risk of common mental disorders (OR=1.7, 95% CI=1.1-2.9, $p<0.05$)[102] (Deribew, A., T, 2010). HIV positivity was also associated with increased risk for extraulmonary TB (OR=4.93, 95% CI = 1.95-12.46)[13] (Yang Z, 2004). HIV positive patients with TB tend to have poorer TB outcome compared to those without HIV. About 88% of patients with TB who were not HIV seropositive had good TB outcome, while only 73% of patients with TB who were HIV seropositive had good TB outcome. The proportion of TB patients who died during treatment was more than three

times higher in those who were HIV positive compared to those who were HIV negative (11% vs 3.5%) (WHO, Global tuberculosis report 2015). In many countries, HIV/AIDS is considered even as a threat to national security (WHO, The World Health Report 2001).

Summarising, past studies show that HIV/AIDS is associated with significant psychiatric morbidity and that psychiatric morbidity in chronic medical conditions affect compliance and lead to poor outcome. Substance use disorders significantly increase the risk of HIV/AIDS, and also affect compliance with drug regimen.

MATERIALS AND METHODS

METHODOLOGY

STUDY DESIGN:

Cross sectional study

PLACE OF STUDY:

Anti –Retroviral Therapy, Center, Govt.Kilpauk Medical College

DURATION OF STUDY:

6 months

Sample size Calculation:

N=4pq/d*d

N- Total Number sample size, p – prevalence, q – 100-prevalence, d-precision.

p = 45% (percentage of psychiatric morbidity in HIV/AIDS)

d = Absolute precision= 10%

Calculation N=4 x (0.45 x 0.55) / 0.1 x 0.1 = 99

Assuming 10 % non-response = 99 + 10 = 109; Rounding off = 109

INCLUSION CRITERIA

1. HIV/AIDS, as diagnosed by a physician.

2.Atleast one month passed since initiation of treatment

3.Currently on treatment

4.Age between 18 and 60 yrs

5.Given consent for the study

EXCLUSION CRITERIA

Acutely ill patients whom psychiatric interview is not possible

Patients who did not consent

MATERIALS AND METHODS:

Our study is a cross sectional study conducted at ART CENTER, Government Kilpauk Medical College, chennai. A total of 109 consecutive patients attending the ART clinic in Govt. Kilpauk Medical College, fulfilling the inclusion and exclusion criteria were interviewed. Informed consent were obtained from those willing to participate.

All patients were diagnosed with HIV/AIDS by consultant chest physicians .A semi structured socio demographic proforma (Name, age, pre ART/ART/no., gender, education, occupation, family income per month, marital status, type of family) and Kuppuswamy socioeconomic status scale were applied to participants. Information regarding disease related factors like duration of illness, stages of HIV/AIDS,cd4 count, H/O default, presence of TB coinfection and other opportunistic infections, ART drugs the patient is on, past history of psychiatric illness and family history of psychiatric illness were collected. Symptom Check List 90 (SCL-90) was used to screen for patients, ICD 10 guidelines were used for diagnosis of psychiatric disorders, Hamilton Depression rating scale (HAM-D 17) and Hamilton Anxiety rating scale (HAM-A) were used for assessing the severity of depressive and anxiety disorders respectively. Fagerstorm nicotine dependence test score and Alcohol

Use Disorder Identification Test (AUDIT) score were used to assess the severity of nicotine dependence and alcohol dependence respectively.

ETHICAL APPROVAL

Ethical approval for this study was obtained from the Ethics committee, Government Kilpauk Medical College, Chennai

TOOLS USED:

1. A semi structured socio demographic proforma (Name, age, ART no, sex, education, occupation, socioeconomic status, social support, marital status, type of family, time interval between HIV diagnosis and treatment).
2. Kuppuswamy socioeconomic status scale
3. Symptom checklist-90 to screen the patients
4. ICD 10 clinical and diagnostic criteria
5. Hamilton rating scale for Depression (HAM-D)
6. Hamilton rating scale for Anxiety (HAM-A)
7. Fagerstrom nicotine dependence test
8. Alcohol Use Disorder Identification Test (AUDIT)
9. Montreal cognitive assessment (MoCA)- for cognitive functions
10. Multidimensional Scale of Perceived Social Support- for support system
11. Morisky medication adherence – for medication adherence
12. Karnofsky Performance Status Scale (KPS) – for functional ability of the patients.

SYMPTOM CHECKLIST -90 REVISED

The Symptom checklist-90 is a self-report psychometric questionnaire published. It is used to assess a wide range of psychological problems and symptoms of psychopathology. It contains 90 items, yielding 9 scores along primary symptoms and 3 scores among global distress indices. The main symptoms that are assessed are depression, somatization, obsessive-compulsive disorder, anxiety, interpersonal sensitivity, phobic anxiety, paranoid ideation, hostility and psychotism. The three universal distress indices are global wellness index, hardiness and symptom free. The internal consistency coefficient rating ranged from 0.80 for depression and 0.77 for psychotis(Pearson, 2016) It is one of the most commanly used measures of psychological distress in research and clinical practice. (John.M.Gottman et al,2009).

HAMILTON RATING SCALE FOR DEPRESSION

The Hamilton rating scale for depression was developed in the 1950. It is a clinician administered scale and is one of the commanly used scales in psychiatry. The scale was initially designed with 21 items. Later, 4 items (diurnal variation, de-realization, paranoid symptoms and obsessional symptoms) were dropped. Diurnal difference was considered as not being a measure of depression or its intensity. Now this is 17 items in the scale, though the original 21 items version is also occasionally used. In this study, we were

used the 17 items version. The following items are present in the scale: depressed mood, feeling of guilt, suicide, insomnia early, insomnia middle, insomnia late, work and activities, retardation, agitation, anxiety (psychic), anxiety(somatic), somatic symptoms (gastrointestinal), somatic symptom (general), genital symptoms, hypochondriasis, loss of weight and insight. Each item was scored on a three to five point scale (0-2 to 0-4). Individual scores were later summed up to give a total score. The scale had been shown to be sensitive over a wide range of depression severity in studies. The inter-rater reliability for the scale has found to be good (0.82) (Cicchetti DV et al., 1983). Internal consistency of the scale was also found to be 0.83. Validity of the scale range from 0.65 to 0.90 .Validity also extremely correlated with behavioral features, and somatic features account for about half of the total possible score in the scale. The maximum possible total score on the scale is 52. (Hamilton M et al.,1960, Williams JP et al.,1988, Carroll BJ et al.,1973, Baer L et al., 2010).

HAMILTON RATING SCALE FOR ANXIETY

The Hamilton rating scale for anxiety is designed to measure anxiety in patients already diagnosed with anxiety disorders. The scale is not intend to be a diagnostic tool. The scale is also not means for using disorders other than neurotic anxiety states. The scale consist of 14 items and is clinician administered. It takes for about 15 to 30 minutes to administer this scale. The

items in this scale are: anxious mood, insomnia, intellectual, depressed mood, tension, fears, somatic (muscular), somatic (sensory), cardiovascular systems, respiratory systems, gastrointestinal systems, genitourinary systems, autonomic systems and behavior at interview. Each item was scored on a five point scale 0 to 4. The scores were all added up to yield the total score. In addition to the total score, two subscales have been suggested-cyclic subscale and somatic subscale. A scale had been evaluated for reliability and had been found to have an inter-rater correlation of 0.89. Internal consistency ranges from 0.77 to 0.92. (Hamilton MA et al., 1959, Maier W et al.,1988, Baer L et al.,2010).

ALCOHOL USE DISORDER IDENTIFICATION TEST

The alcohol use disorder identification test (AUDIT) was developed by the World Health Organisation as a simple method of screening for excessive drinking. It is one of the two scales recommended by the National Institute of Alcohol Abuse and Alcoholism (USA) for screening of alcohol related problems. It can be self administered or interviewer administered. It takes about 2-5 minutes to complete. There are 10 items in the scale that measure the following: 1) frequency of drinking, 2) typical quantity per day, 3) frequency of heavy drinking, 4) impaired control over drinking, 5) increased salience of drinking, 6) morning drinking, 7) guilt after drinking, 8) blackouts, 9) alcohol related injuries, 10) others concerned about drinking. Each item is scored from 0-4 and the total score is added up. There are three domains in the AUDIT – hazardous alcohol use, dependence symptoms and harmful alcohol

use. Items 1-3 assess hazardous alcohol use, 4-6 assess dependence symptoms and 7-10 assess harmful alcohol use pattern. A cut off of 8 for problematic drinking was found to have a sensitivity of around 0.90, and specificity of around 0.80 across countries. It has been found to be sensitive and specific to alcohol use disorder. It has been found to have good reliability and validity across countries and population subgroups. Cronbach's alpha for internal consistency was found to be around 0.80. A high correlation coefficient of 0.78 has been found between AUDIT and the CAGE questionnaire. It is also considered a useful tool for identifying people who would benefit from reducing their drinking even if they are not alcohol dependent. AUDIT score has been categorised in to four risk zones. Scores 0-7 fall in zone 1, scores 8-15 fall in zone II, scores 16-19 fall in zone III and scores 20-40 fall in zone IV (Baer L 2010, WHO The alcohol Use disorders identification test 2001, Allen JP, 1997).

KUPPUSWAMY SOCIOECONOMIC STATUS SCALE

Kuppuswamy socioeconomic status scale was a commonly used scale to assess the socioeconomic class of study participants. It was published in 1981 initially but modifications have been published frequently to account for the changing price index. It have three categories to be scored-head of the family educational level, the head of the family- occupation and income per month. Education was scored from 1 to 7, occupation from 1 to 10 and

monthly family income from 1 to 12. The total was added up. There were five socioeconomic classes that can be derived from the scale-upper, upper middle, middle/lower middle, lower/upper lower and lower. The scale requires modification from time to time because of the changing price index that affects the validity of the income per month subset in the scale (Kumar BR et al., 2012, Sharma R et al., 2014, Patro BK et al., 2012).

MONTREAL COGNITIVE ASSESSMENT

Ziad Nasreddine was created, Montreal Cognitive assessment in 1996 at Montreal, Quebec. It is a one page 30-point test, and needs around fifteen minutes to administered the test. MoCA scores range between 0 and 30. A score of 26 and above is considered to be normal. It assesses numerous cognitive domains. The short term memory recall test (5 points) involves two learning trials of 5 nouns and delayed recall after 5 minutes. Visuospatial abilities are assessed using a clock-drawing test (3 points) and a 3-dimensional cube copy test (1 point). Executive functions are assessed by using an alternation test adopted from the trial making B test (1 point), a phonemic fluency task (1 point) and a two – item verbal abstraction task (2 points). Attention, concentration and working memory are evaluated by using a sustained attention test (target detection using tapping; 1 point), serial subtraction test (3 points), and digits forward and backward test (1 point each) language is assessed using a 3 –item confrontation naming test with low-

familiarity animals (lion, camel, rhinoceros; 3 points), repetition of two syntactically complex sentences (2 points). Finally, orientation to time and place is assessed. (Nasreddine Z et al.,2005)

MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT

Numerous studies have demonstrated that social support as a buffer for psychological distress. Zimet et al. developed the Multidimensional Scale of Perceived Social Support, which have been commanly used in both clinical and non clinical samples. (zimet et al., 1988), It is an attempt to measure social support,

The MSPSS is intended to assess the extent to which an individual perceives social support from many(mainly three) sources: Family (Items 3, 4, 8, and 11), Friends (Items 6, 7, 9, and 12) and Significant others (Items 1, 2, 5, and 10). The MSPSS is a brief, easy to administer, and it is self reported questionnaire which contains 12 items rated on a seven point Likert-type scale with scores ranging from ‘very strongly disagree’ to very strongly agree. The MSPSS have proven to be psychometrically sound in diverse samples and to has good internal reliability and test-retest reliability, and robust factorial validity.

KARNOFSKY PERFORMANCE STATUS SCALE (KPS)

The Karnofsky Performance Status Scale is used to classify the patients to be their functional impairment. This is also be used to compare effectiveness of different therapies and to assess the prognosis in individual patients. The lower the Karnofsky score, the poorer the survival for most serious illness. The Karnofsky Performance Score ranking runs from 100 to 0, where 100 is “perfect” health and 0 is death. Dr. David A. Karnofsky was described the scale in 1948. (Karnofsky et al)

- 100- Normal; no evidence of disease, no complaints
- 90- Able to carry out normal activity, minimal motor signs or symptoms of disease
- 80- Able to do normal activity with effort, some signs or symptoms of disease.
- 70- Able to cares for self and unable to carry on normal activity or to do active work.
- 60- occasional assistance required, but able to care for most of his personal needs.
- 50- considerable assistance required and needs frequent medical care.
- 40- Disabled,needs special care and assistance.
- 30- Severely disabled, hospital admission is needed although death not imminent’

- 20- Very sick, hospital admission essential, active supportive treatment necessary.
- 10- Moribund, fatal processes progressing quickly.
- 0 - Dead.

MORISKY'S MEDICATION ADHERENCE SCALE (MMAS)

The MMAS is a self-reported quesnairre, In this asked about medication- taking behavior in which the specific health issue is inserted for the health concern. The MMAS consists of four items with a scoring scheme of "yes"=0 and "No"=1. The items are summed to give a range of scores from 0 to 4.

STATISTICAL ANALYSIS

Statistical analysis is to be done using computer software, to evaluate the prevalence of psychiatric illnesses in people undergoing treatment for HIV/AIDS will be given as percentage, Chi square test was used to assess the relationship between psychiatric co morbidity and different sociodemographic factors and disease related factors (duration of illness, stages of HIV/AIDS,CD4 count, HIV-TB co infection), to assess the relationship between psychiatric co morbidity and negative behavioural factors like poor adherence and history of defaulting and factors like support systems, functional level of patients. P value was taken to be significant if it was <0.05.

OBSERVATION AND RESULTS

RESULTS:

A total of 114 patients were approached for the study. Of these, 2 patients did not consent to participate in the study and another 3 patients were acutely ill, so were not included in the study. The remaining 109 patients consented to participate in the study. Informed consent was obtained from all these participants.

Of these 109 patients, 52.3% (n = 57) were males, 45% (n = 49) were females, and remaining 2.8% (n = 3) were transgender.

About 70.6% belonged to the age group 18-44 years, 26.6% to the 45-64 years group, and 2.8% to the 65 or more year's group.

Majority (87.2%) belonged to Hindu religion, about 3.7% were Muslims, and 9.2% were Christians.

About 14.7% were illiterate, 54.1% had primary school level education, 17.4% had secondary school level education, 11% had graduate level education, and 2.8% had post graduate level education.

Majorities (46.8%) were unskilled worker, 17.4% were unemployed, 13.8% were semi-skilled workers, and 19.3% were skilled workers and professions were 2.8%. Nine (18.36%) of the forty-nine females were unemployed, while 8 (14.03%) of the 57 males were unemployed, and two of the three transgender were unemployed.

Majority (46.8%) were from upper lower socio-economic status, 12.8% from lower middle, and 33.9% from lower socio-economic status, and 6.4% were from upper middle socio-economic status. No one was from upper socio-economic status.

About 61.5% were married and living with spouse, 4.6% were separated, 16.5% were widowed, and 17.4% were single. About 55% of spouse HIV status were positive, 27.5% spouse HIV status were negative and 17.4% of spouse HIV status were not known. Majority were from nuclear families (54.1%), about 42.2% from joint families, and 3.7% from broken families.

TABLE-1: SOCIO-DEMOGRAPHIC PROFILE OF THE STUDY POPULATION

S. No.	Socio-demographic variable		n	Percentage (%)
2	Age	18-44	77	70.6
		45-64	29	26.6
		65 or more	3	2.8
	Sex	Male	57	52.3
		Female	49	45
		Transgender	3	2.8
3	Religion	Hindu	95	87.2
		Muslim	4	3.7
		Christian	10	9.2
4	Education	Illiterate	16	14.7
		Primary school	59	54.1
		Secondary	19	17.4
		Graduate	12	11.0
		Post Graduate	3	2.8
5	Occupation	Unemployed	19	17.4
		Unskilled worker	51	46.8
		Semi-skilled worker	15	13.8
		Skilled worker	21	19.3
		Profession	3	2.8

TABLE-1: SOCIO-DEMOGRAPHIC PROFILE OF THE STUDY POPULATION

S. No.	Socio-demographic variable		n	Percentage (%)
7	Socio-economic status	Upper	0	0
		Upper middle	7	6.4
		Lower middle	14	12.8
		Upper lower	51	46.8
		Lower	37	33.9
8	Marital status	Married	67	61.5
		Single	19	17.4
		Widowed	18	16.5
		Separated	5	4.6
9	Spouse HIV status	Positive	60	55
		Negative	30	27.5
		Not known	19	17.4
10	Type of family	Nuclear	59	54.1
		Joint	46	42.2
		Broken	4	3.7

Fig-1: Gender wise distribution of study population

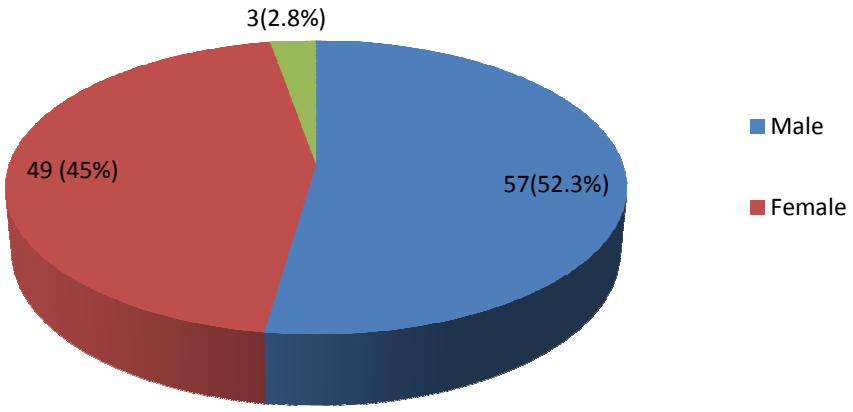


Fig-2: Education wise distribution of study population

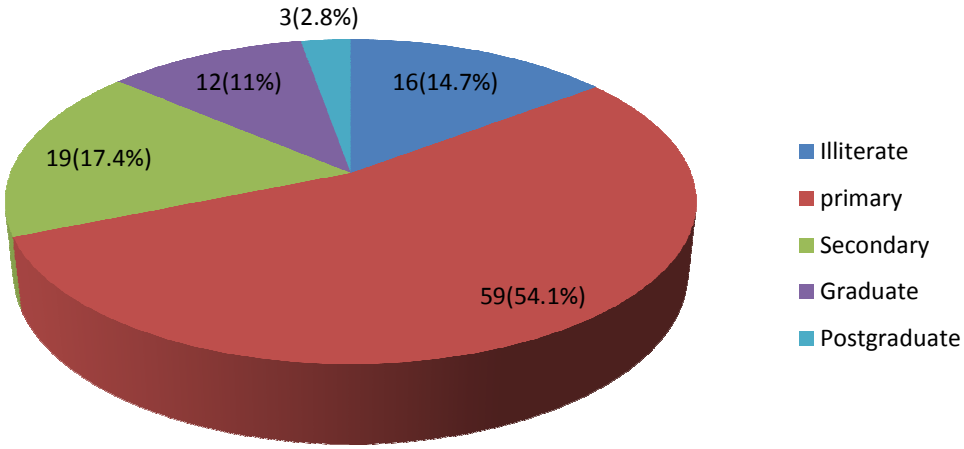


Fig-3: Socioeconomic status of study population

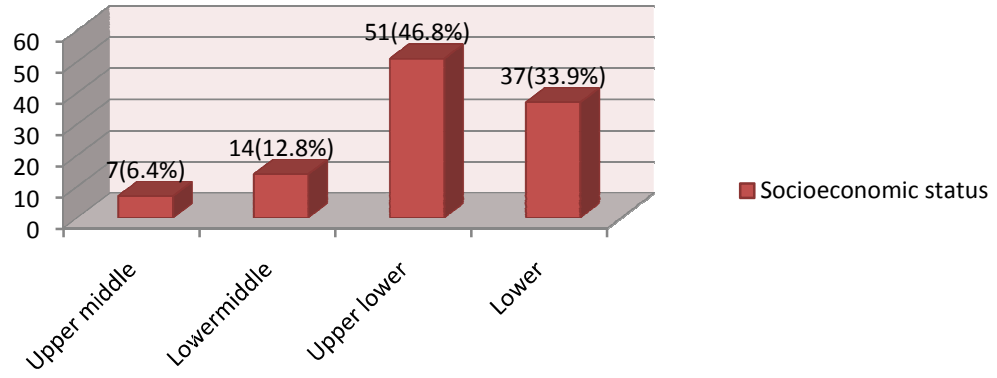
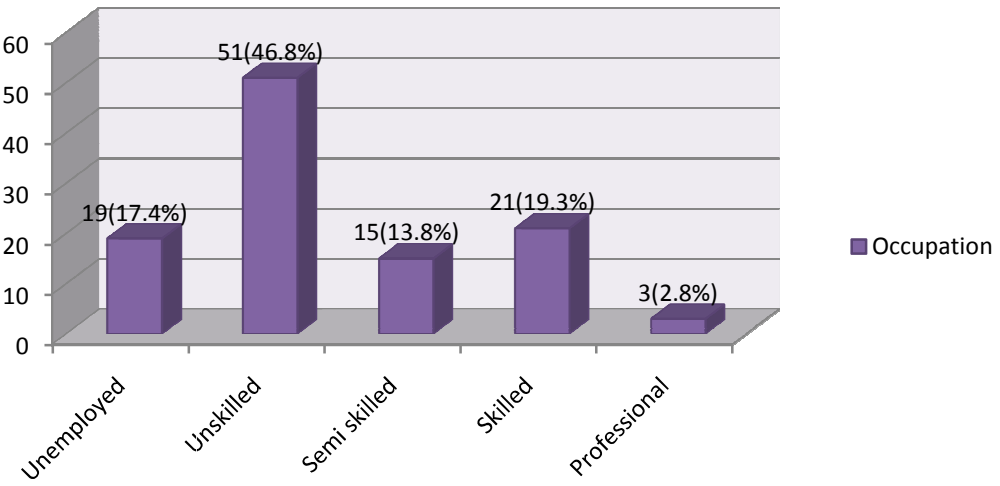


Fig-4: Occupation of study population



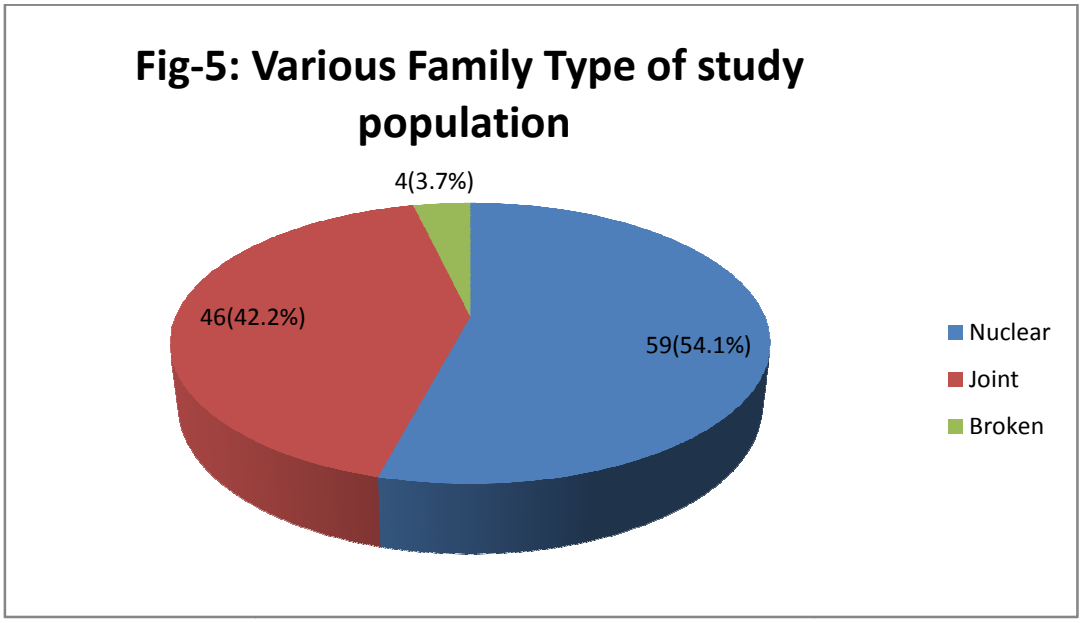


Fig-5: Various Family Type of study population
4(3.7%)
46(42.2%)
59(54.1%)
Nuclear
Joint
Broken

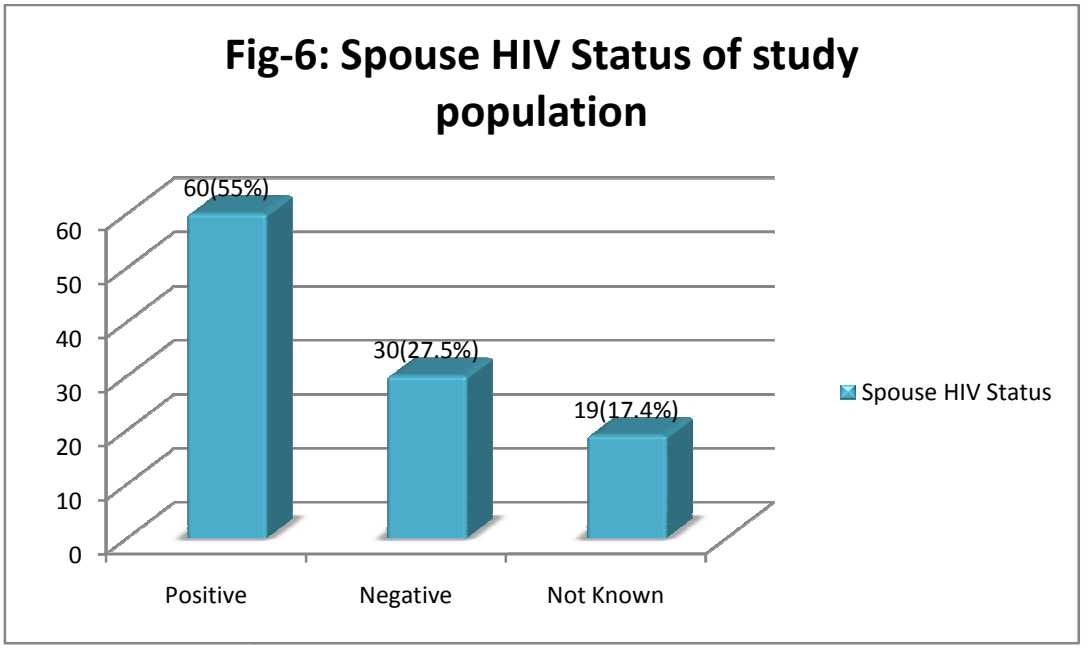


Fig-6: Spouse HIV Status of study population
60(55%)
30(27.5%)
19(17.4%)
0
10
20
30
40
50
60
Positive
Negative
Not Known
Spouse HIV Status

HIV/AIDS DISEASE RELATED FACTORS

Data regarding various HIV/AIDS disease related factors – were analysed. About mode of HIV transmission, 67% had sexual mode transmission, through blood transfusion were 7.3%, and vertical transmission were 4.6%, through injection drug use 1.8%, while the remaining (19.3%) were not known/not disclosed about their mode of HIV transmission.

About HIV stages, about 85% had stage I HIV, 8.3%% had stage II HIV, 7.3% had stage III HIV, and 6.4% had stage IV HIV. Regarding CD4 count, 52.3% had CD4 count of more than 500, 17.4% had between 350-500 and 16.5% had between 200-350, while remaining 13.8% had CD4 count of less than 200. In treatment modality, all 109 patients were on ART therapy and nobody was on pre-ART therapy. TB co-infection was present in about 9.2% (n=10). The rest 90.8% did not have TB co-infection.

About ART treatment regimen most of patients 62.4% (n=68) were on Tenofavir/Lamivudine/Efavirenz regimen. About 27.5% (n=30) were on Zidovudine/Lamivudine/Nevirapine regimen and 6.4% (n=7) were on Tenofavir/atazanavir/Ritonavir and each 0.9% (n=1) was on Abacavir/Lamivudine/Efavirenz, Tenofavir/Lamivudine/Nevirapine and Zidovudine/Lamivudine/Efavirenz.

Data regarding duration HIV/AIDS illness – were analysed. About 33% (n=36) were on between 5-10 years, 25.7% (n=28) were on between 1-5

years, 24.8% were on more than 10 years, and the remaining 16.5% were on less than 1 year.

TABLE-2: HIV RELATED FACTORS IN THE STUDY POPULATION

S. No.	HIV related factors		N	Percentage (%)
1	Mode of Transmission	Sexual	73	67
		Injection drug use	2	1.8
		Blood transfusion	8	7.3
		Vertical transmission	5	4.6
		Not known/Not disclosed	21	19.3
2	HIV stage	1	85	78
		2	9	8.3
		3	8	7.3
		4	7	6.4
3	CD4 count	>500	57	52.3
		350-500	19	17.4
		200-350	18	16.5
		<200	15	13.8

4	Treatment Modality	Pre ART	-	-
		ART	109	100
5	Treatment Regimen	1) tenofavir + lamivudine + efavirenz	68	62.4
		2) abacavir+ lamivudine + efavirenz	1	0.9
		3) Zidovudine +lamivudine + Nevirapine	30	27.5
		4)Tenofavir + lamivudine + nevirapine	1	0.9
		5) tenofavir + atazanavir + ritonavir	7	6.4
		6)zidovudine + lamivudine + efavirenz	1	0.9
		7) Others	1	0.9
6	Duration of illness	<1 year	18	16.5
		1-5 years	28	25.7
		5-10 Years	36	33
		>10 years	27	24.8

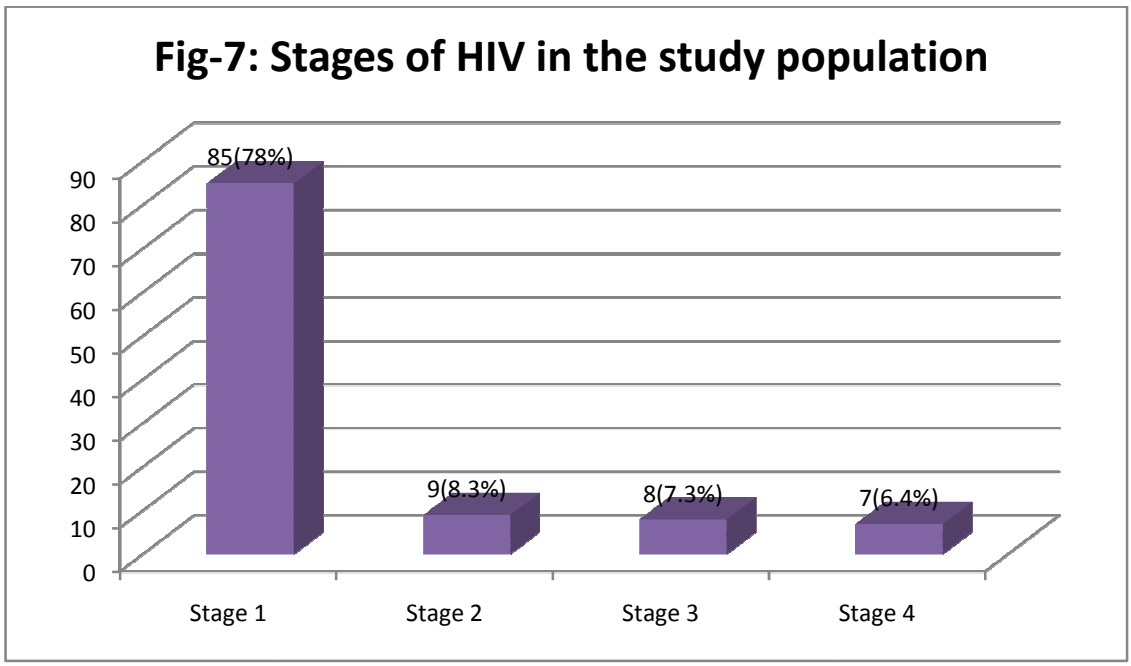


Fig-7: Stages of HIV in the study population
90
80
70
60
50
40
30
20
10
0
85(78%)
9(8.3%)
8(7.3%)
7(6.4%)
Stage 1
Stage 2
Stage 3
Stage 4

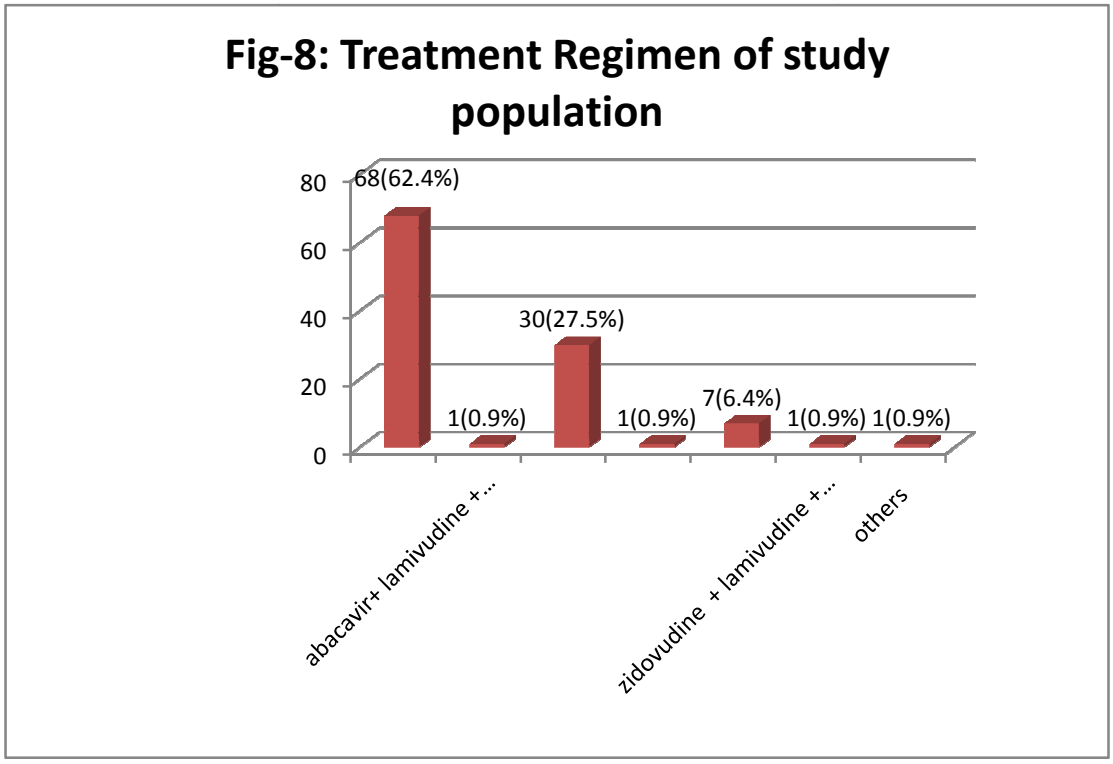
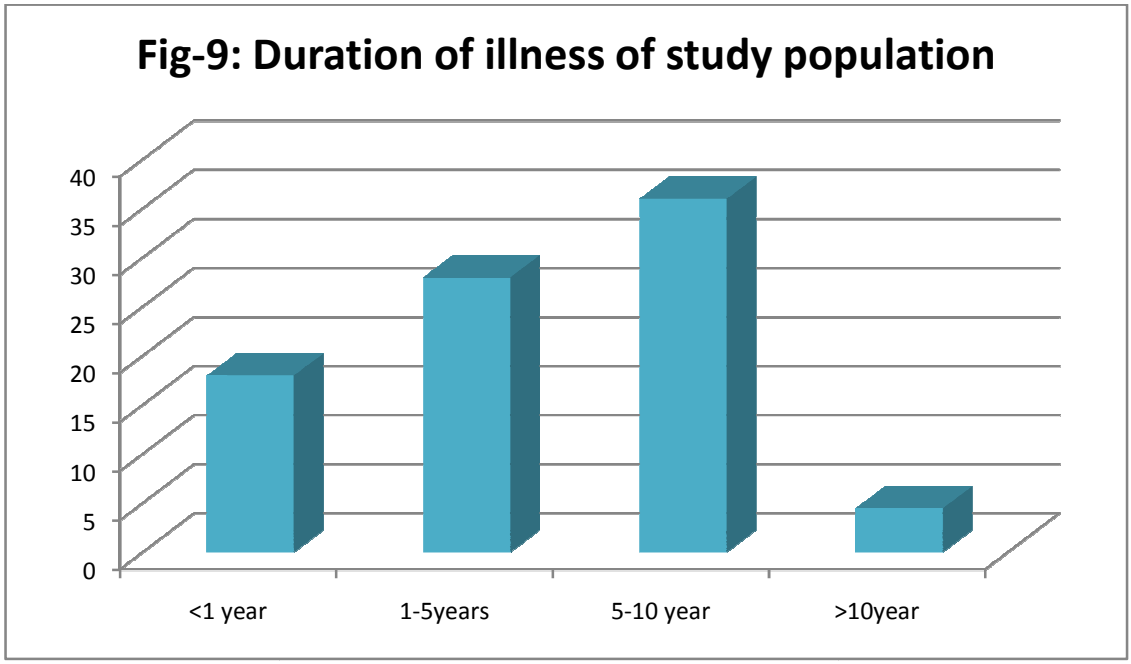


Fig-8: Treatment Regimen of study population
80
60
40
20
0
68(62.4%)
1(0.9%)
30(27.5%)
1(0.9%)
7(6.4%)
1(0.9%)
1(0.9%)
abacavir+ lamivudine +...
zidovudine + lamivudine +...
others



MEDICAL CO-MORBIDITY IN THE STUDY POPULATION

Analysis of data regarding the presence of medical co-morbidities showed that, about 20.8% (n=22) had at least one medical co-morbidity. The most common medical co-morbidity was Type II Diabetes Mellitus. It was present in 9.2% (n = 10) people.

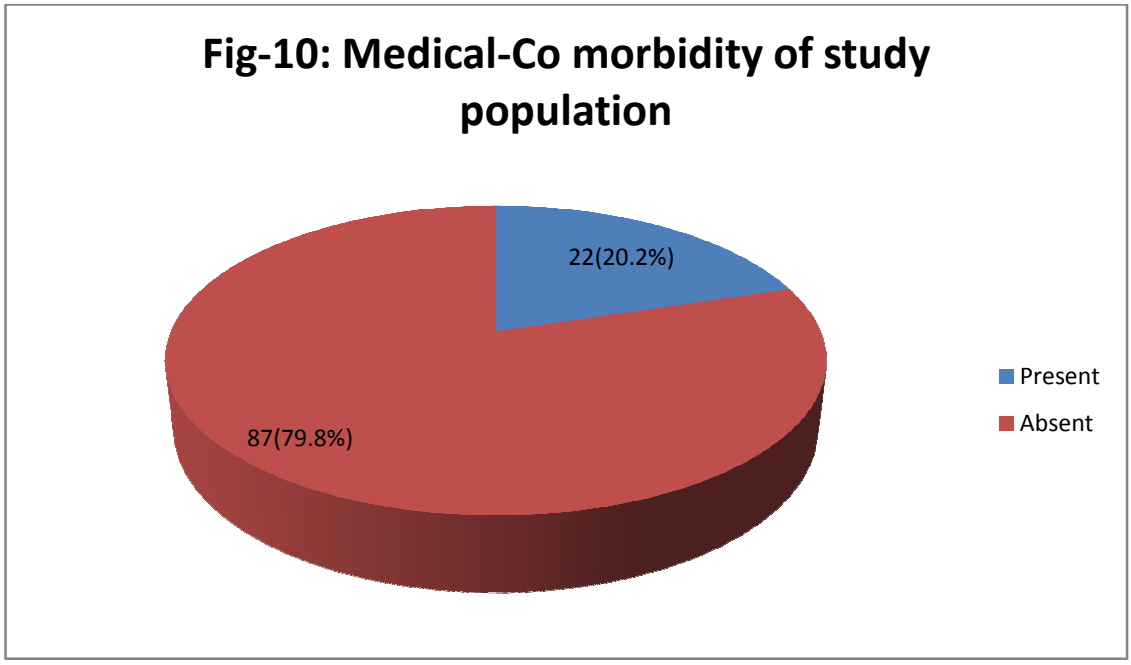
The next common co-morbidity was systemic hypertension, which was present in 3.7% (n = 4) people. Both Type 2 Diabetes Mellitus and systemic hypertension was present in 3 (2.8) people.

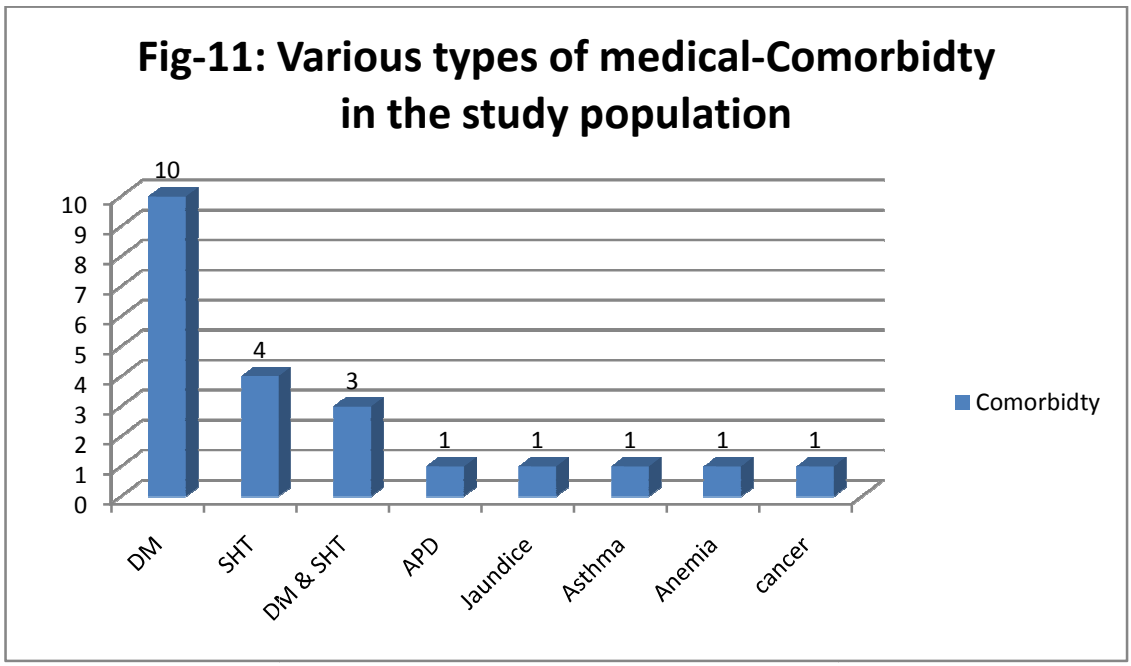
Anemia, Asthma, Acid peptic disease, mouth cancer and Jaundice were present in 1 person each.

Some patients actually had more than one medical co-morbidities.

Table-3: Medical co-morbidities in the study population

s.no	Comorbidity	Frequency	Percentage
1	**DM**	10	9.2
2	**SHT**	4	3.7
3	**DM+SHT**	3	2.8
4	**APD**	1	0.9
5	**Jaundice**	1	0.9
6	**Asthma**	1	0.9
7	**Anemia**	1	0.9
8	**Cancer**	1	0.9





OPPORTUNISTIC INFECTION IN THE STUDY POPULATION

Analysis of data regarding the presence of opportunistic infection showed that, about 19.3% (n=21) had at least one opportunistic infection. The most common opportunistic infection was Tuberculosis (both pulmonary and extra-pulmonary). It was present in 10 (9.2%) people.

The next common opportunistic infection was oral candidiasis, which was present in 6 (5.5%) people, and herpes zoster infection was present in 3 (2.8) people.

Seborrhic dermatitis and Angular stomatitis were present in 1 person each, and 88 people were not having any opportunistic infection.

Table-4: Opportunistic infection in the study population

s.no	Oppurtunistic Infection	Frequency	Percentage
1	**TB**	10	9.2
2	**Candidiasis**	6	5.5
3	**Herpes**	3	2.8
4	**Sebborhic Dermatitis**	1	0.9
5	**Angular Stomatitis**	1	0.9
6	**No**	88	80.7

Fig-12: Opportunistic Infection of study population

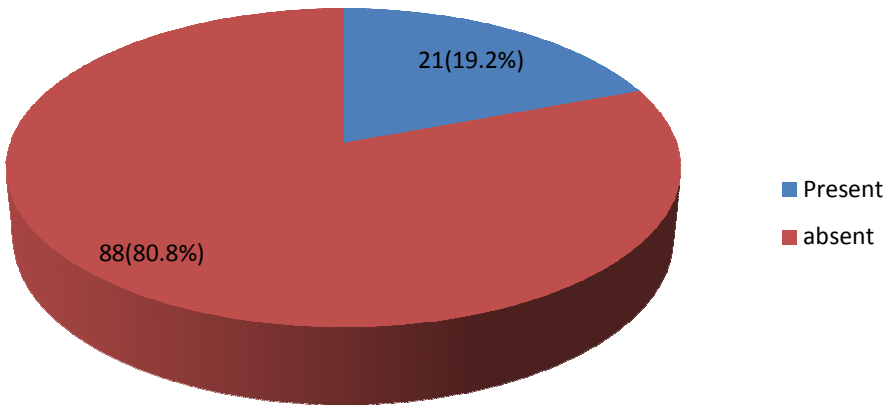
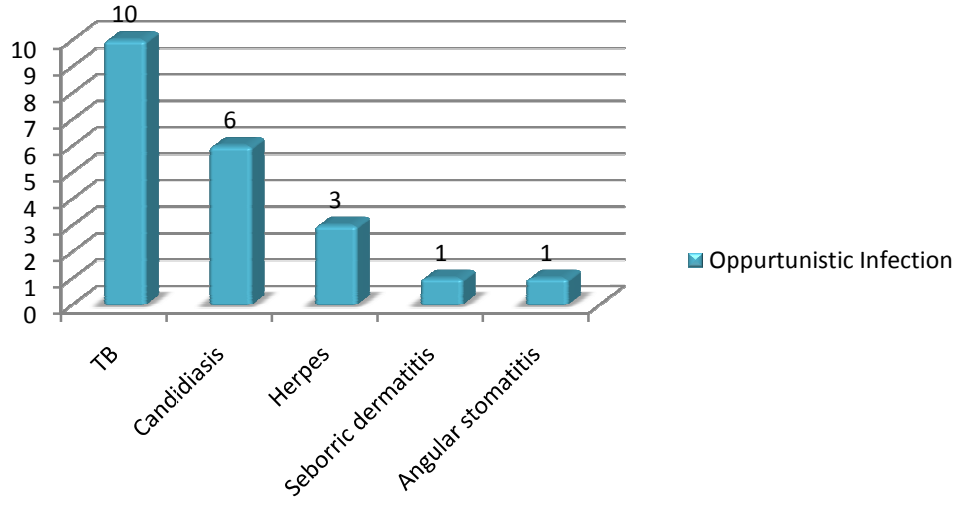


Fig-13: Various types of Opportunistic Infection in the study population



PREVALENCE OF PSYCHIATRIC ILLNESSES IN THE STUDY POPULATION

Of the 109 people who participated in the study, 49 people (44.95%) had at least one psychiatric illness, including substance use disorders.

Depressive disorder was present in 23 (21.1%) people. Among these, majority (47.8%, n=11) had moderate depressive disorder. Ten (43.4%) had mild depressive disorder, and 2 (8.7%) had severe depressive disorder as measured by Hamilton depression rating scale.

Adjustment disorder was present in 9 (23.5%) patients. Eight (88.9%) had adjustment disorder with depressive symptoms and one (11.1) had adjustment disorder with anxiety symptoms.

Anxiety disorders were present in 2 (1.8%) patients. One had generalised anxiety disorder, while other had given a diagnosis of unspecified anxiety disorder as criteria, mostly duration criterion, were not fulfilled for other anxiety disorders. Among these, about 50 % had mild anxiety and 50% had moderate anxiety as measured by Hamilton anxiety rating scale.

Regarding substance use, alcohol use and smoking were the disorders observed in the study population. Alcohol dependence syndrome was present in 10 (9.2%) people. Nicotine dependence syndrome (smoking) was present in 2 (1.8%) people.

Regarding severity of alcohol dependence, majority (50%) fell in the risk zone 4 on AUDIT scores. About 10% fell in risk zone 1, 20% in risk zone 2, and 20% in risk zone 3.

Regarding severity of nicotine dependence, one (50%) had medium dependence, while another one (50%) had high dependence, based on Fagerstrom test for nicotine dependence.

Psychosis were present 2.8% (n = 3) of study population.

Data regarding past history of psychiatric illness were analysed. One had past history of alcohol dependence syndrome, history of dependence in past, but was now abstinent for at least 12 months. About 1.8% (n=2) had a past history depression. No other psychiatric illness was present in the past in the study population.

Regarding family history of psychiatric illness, about 18.3% (n=20) had a family history of psychiatric illness – alcohol dependence were present in 11 patients family persons, family history of depression were present in 4 person, Bipolar affective disorder was present in one person, family history of psychosis were present in three persons and one had family history of obsessive-compulsive disorder, No other psychiatric illness was present in the families of the study population.

TABLE-5: PREVALENCE OF PSYCHIATRIC ILLNESSES IN THE STUDY POPULATION

S. No.	Psychiatric illness		n	Percentage (%)
1	Depressive disorder	Mild	10	43.4% of depression
		Moderate	11	47.8% of depression
		Severe	2	8.7% of depression
		Total	23	21.1% of total patients
2	Adjustment disorder	With depressive symptoms	8	88.9% of adjustment disorder
		With anxiety symptoms	1	11.1% of adjustment disorder
		Total	9	8.3% of total patients
3	Anxiety disorder	Mild	1	50% of anxiety
		Moderate	1	50% of anxiety
		Severe	0	0% of anxiety
		Total	2	1.8% of total population
4	Alcohol dependence syndrome	Risk zone I	1	10% of alcohol dependence
		Risk zone II	2	20% of alcohol dependence
		Risk zone III	2	20% of alcohol dependence
		Risk zone IV	5	50% of alcohol dependence
		Total	10	9.2% of total patients

5	Nicotine dependence syndrome	Very low	0	0% of NDS
		Low	0	0 of NDS
		Medium	1	50 of NDS
		High	1	50 of NDS
		Very high		0 of NDS
		Total	2	1.8% of total patients
6	Psychosis		3	2.8% of total patients
7	Past history of psychiatric illness		3	2.75% of total patients
8	Family history of psychiatric illness		20	18.3% of total patients

Table-6: Family history of Psychiatric illness

Family history of Psychiatric illness	**Frequency**	**Percentage**
Present	20	18.3
Absent	89	81.7

Table-7: Past History of Psychiatric illness

Past History of Psychiatric illness	Frequency	Percentage
Present	3	2.8
Absent	106	97.2

Table-8: Psychiatric illness among HIV patients

Psychiatric illness	Frequency	Percentage
No	60	55
Yes	49	45

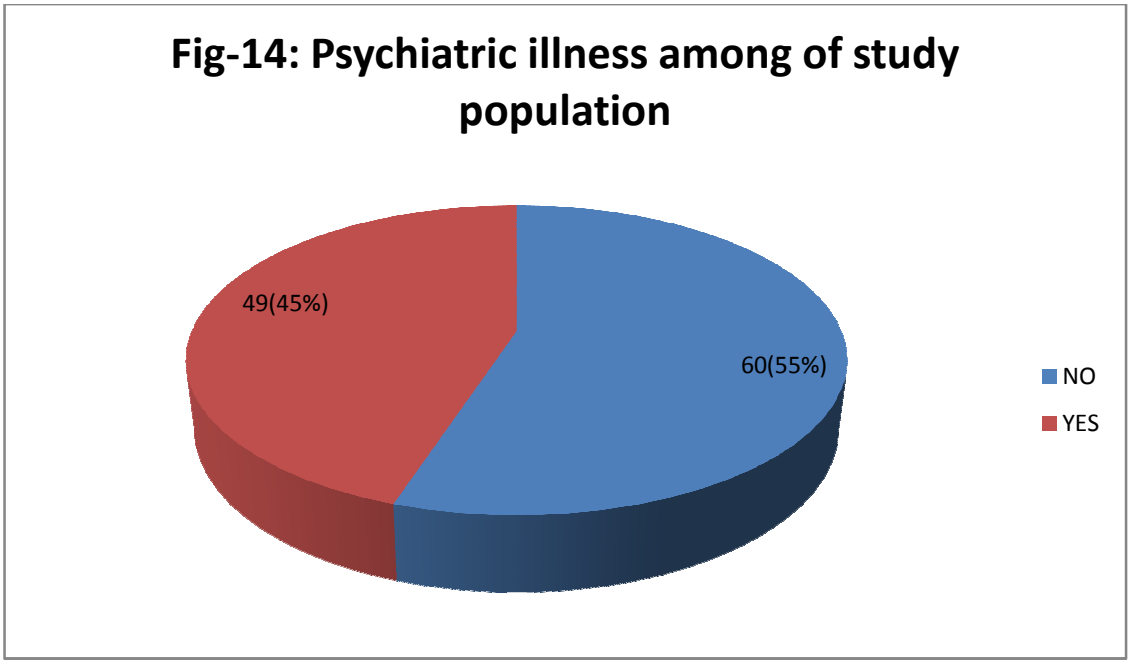


Fig-15: Various Type of Psychiatric illness in the study population

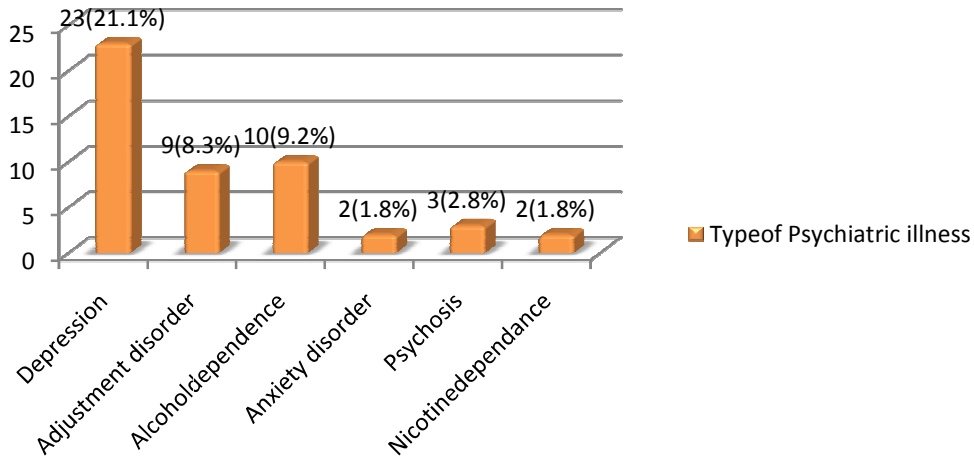
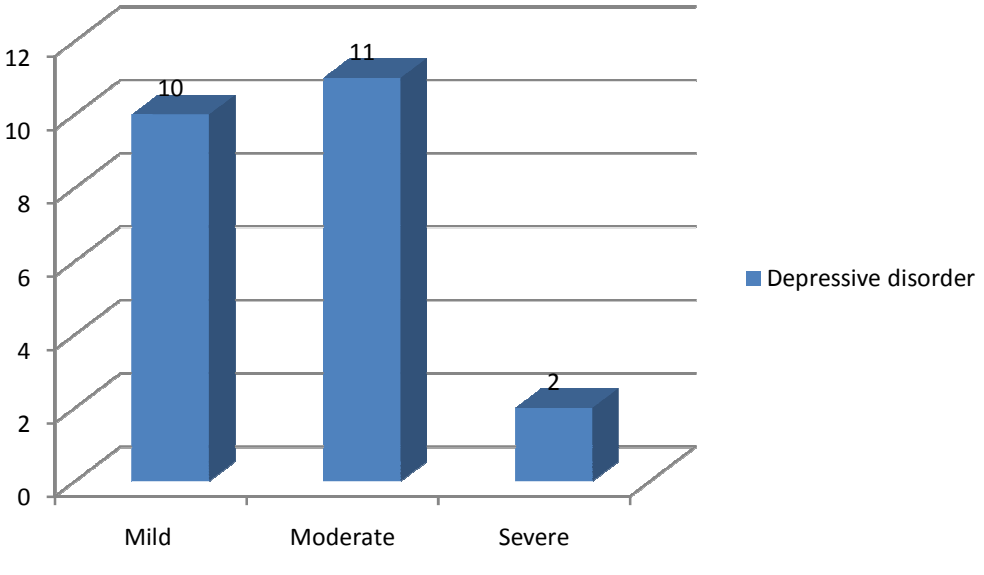


Fig-16: Severity of Depression in the study population



ASSOCIATION BETWEEN SOCIO-DEMOGRAPHIC FACTORS AND PSYCHIATRIC ILLNESS IN HIV/AIDS

Various socio-demographic data collected during the study were analysed for their relationship with psychiatric illnesses in HIV/AIDS. Chi squared and Fisher's exact probability were used for this analysis.

In the analyses, psychiatric illness in HIV/AIDS population, it was observed that male sex had a statistically significant association with presence of psychiatric illness. Chi square test was used and the value was 8.028, p=0.018.

Table-9: Association between sex and psychiatric illnesses in the study population

Gender	Psychiatric illnesses		Chi square	P value
	Present	Absent		
Male	27	30	**8.028**	**0.018**
Female	33	16		
Transgender	0	3		

Another analysis to observe the relationship between marietal status and presence of psychiatric illnesses. Marital status (single) was found to have a statistically significant association with presence of psychiatric illnesses (Chi

squared = 15.08, p = 0.002). All other socio-demographic variables - age group, religion, education, occupation, and socio-economic status did not have statistically significant association with presence of psychiatric illnesses.

Table-10:Association between marital status and presence of psychiatric illness in the study population:

Marietal Status	Psychiatric illness		Chi square	P value
	Present	Absent		
Married	42	25		
Single	4	15	**15.08**	**0.002**
Widowed	13	5		
Seperated	1	4		

TABLE-11:SOCIO-DEMOGRAPHIC FACTORS AND PRESENCE OF PSYCHIATRIC ILLNESSES

S. No.	Socio-demographic variable		Psychiatric illnesses		Chi square =	p value
			Absent	**Present**		
1	Age (years)	<18	1	0	3.84	0.279
		18-44	39	37		
		45-64	17	12		
		65 or more	3	0		
2	Sex	Male	27	30	**8.02**	**0.018**
		Female	33	16		
		Transgender	0	3		
3	Religion	Hindu	55	40	5.312	0.07
		Muslim	0	4		
		Christian	5	5		

4	Education	Illiterate	9	7	1.02	0.906
		Primary school	31	28		
		Secondary	10	9		
		Graduate	8	4		
		Post Graduate	2	1		
5	Occupation	Unemployed	9	10	4.38	0.35
		Unskilled worker	33	18		
		Semi-skilled worker	6	9		
		Skilled worker	10	11		
		Profession	2	1		

SOCIO-DEMOGRAPHIC FACTORS AND PRESENCE OF PSYCHIATRIC ILLNESSES

S. No.	**Socio-demographic variable**		**Psychiatric illnesses**		Chi square value	p value
			Absent	**Present**		
6	Socio economic status	Upper middle	4	3	0.943	0.815
		Lower middle	8	6		
		Upper lower	30	21		
		Lower	18	19		
7	Marital status	Married	42	25	**15.08**	**0.002**
		Single	4	15		
		Widowed	13	5		
		Separated	1	4		
8	Type of family	Nuclear	35	24	0.95	0.622
		Joint	23	23		
		Broken	2	2		

HIV/AIDS DISEASE RELATED FACTORS AND PRESENCE OF PSYCHIATRIC ILLNESS

HIV/AIDS disease related factors – HIV stages, CD4 count, duration of illness, presence of HIV-opportunistic infection, adherence and drug regimen – were analysed for association with presence of psychiatric illnesses.

Of these, HIV stage (stage 4) was statistically significantly associated with presence of psychiatric illnesses (chi squared = 23.2, p = <0.001). Association between CD4 count (less than 200) and presence of psychiatric illness was statistically significant (chi squared = 13.48, p = 0.004). Duration of treatment (less than one year of treatment) was significantly associated with presence of psychiatric illnesses (chi squared = 25.98, p = <0.001), and person had poor drug adherence was statistically significantly associated with presence of psychiatric illnesses (chi squared = 11.45, p = 0.003). All other factors – opportunistic infection, and medical co- morbidity – were not statistically associated with presence of psychiatric illnesses.

Table-12: Association between stages of HIV and presence of psychiatric illness – statistically significant

Stages of HIV	Psychiatric illness		Chi square	P value
	Present	Absent		
1	28	57		
2	7	2		
3	7	1		
4	7	0	23.2	**<0.001**

Table-13: Association between stages CD4 Count and presence of psychiatric illness statistically significant

CD4 Count	Psychiatric illness		Chi square	P value
	Present	Absent		
>500	20	37		
350-500	7	12		
200-350	9	9		
<200	13	2	13.48	**0.004**

Table-14: Association between Duration of illness and presence of psychiatric illness statistically significant

Duration of illness	Psychiatric illness		Chi square	P value
	Present	Absent		
<1 year	17	1	**25.98**	**<0.001**
1-5 years	9	19		
5-10 years	9	27		
>10 years	14	13		

Table-15: Association between Drug adherence and presence of psychiatric illness statistically significant

Drug adherence	Psychiatric illness		Chi square	P value
	Present	Absent		
High	21	42		
Medium	18	16		
Low	10	2	**11.45**	**0.003**

TABLE-16: HIV/AIDS DISEASE RELATED FACTORS AND PRESENCE OF PSYCHIATRIC ILLNESSES

S. No.	**variable**		**Psychiatric illnesses**		Chi square value	p value
			Absent	**Present**		
1	Spouse HIV status	Positive	37	23	0.024	0.87
		Negative	19	11		
2	Family history of Psychiatric illness	Yes	6	14	**6.20**	**0.013**
		No	54	35		
3	Past history of Psychiatric illness	Yes	1	2	0.588	0.443
		No	59	47		
4	HIV Stage	1	57	28	**23.2**	**<0.001**
		2	2	7		
		3	1	7		
		4	0	7		

5	CD4 count	>500	37	20	**13.48**	**0.004**
		350-500	12	7		
		200-350	9	9		
		<200	2	13		
6	Duration of illness	<1 year	1	17	**25.98**	**<0.001**
		1-5 year	19	9		
		5-10year	27	9		
		>10 year	13	14		
7	Adherance	High	42	21	**11.45**	**0.003**
		Medium	16	18		
		Low	2	10		

RELATIONSHIP BETWEEN HIV OPPORTUNISTIC INFECTION AND PRESENCE OF PSYCHIATRIC ILLNESS

Presence of HIV Opportunistic infection was analysed to find if any statistically significant association exists with presence of psychiatric illness, No statistical significance was observed.

Table-17: Association between presence of HIV opportunistic infection and presence of psychiatric illness – not significant

HIV opportunistic -infection	Psychiatric illness		Chi square value	P value
	Present	Absent		
TB	9	1	1.33	0.51
Candidiasis	4	2		
Others	4	1		

RELATIONSHIP BETWEEN TYPE OF ANTI-RETROVIRAL THERAPY REGIMEN AND PRESENCE OF PSYCHIATRIC ILLNESS

Most commonly used anti-retroviral therapy regimens are three types – Tenofavir + Lamivudine + Efavirenz, Zidovudine + Lamivudine + Nevirapine, Tenofavir + Atazanavir + Ritonavir. Analyses were done to find if any statistically significant relationship exists between the type of anti-retroviral therapy regimen and presence of psychiatric illness, and statistical significance was observed in Tenofavir + Lamivudine + Efavirenz regimen.

Table-18: Association between type of ART regimen and presence of psychiatric illness – significant

ART regimen	**Psychiatric illness**		**Chi square**	**P value**
	Present	**Absent**		
Tenofavir + Lamivudine + Efavirenz	34	34	**14.29**	**0.0007**
Zidovudine + Lamivudine + Nevirapine	6	24		
others	9	2		

RELATIONSHIP BETWEEN PRESENCE OF MEDICAL CO-MORBIDITIES AND PSYCHIATRIC ILLNESS

We analysed the association between the presence of other medical co-morbidities and the presence of psychiatric illness in the study population. We did not find any statistical significance in the analyses.

Table-19: Association between presence of medical co-morbidities and presence of psychiatric illnesses - not significant.

Presence of medical co-morbidities	Psychiatric illnesses		Chi square	P value
	Present	Absent		
DM	5	5	0.53	0.91
SHT	2	2		
DM + SHT	1	0		
Others	3	2		

FAMILY/PAST HISTORY OF PSYCHIATRIC ILLNESS AND CURRENT PRESENCE OF PSYCHIATRIC ILLNESS IN THE STUDY POPULATION

Data regarding presence of family history of psychiatric illnesses in the study population was analysed for association with current presence of psychiatric illness. Of the 109 participants, 20 had a family history of psychiatric illness. Family history of psychiatric illness was significantly associated with current presence of psychiatric illness. (chi square=6.20, p=0.013)

No statistically significant relationship was observed in analysis for association between past history of psychiatric illness and current presence of psychiatric illness. (chi square=0.588, p=0.443)

Table-20: Association between presence of family history of psychiatric illness and current presence of psychiatric illness - significant

Family H/O psychiatric illnesses	**Current psychiatric illness**		**Chi square**	**P value**
	Present	**Absent**		
Present	14	6	**6.20**	**0.013**
Absent	35	54		

Table-21: Association between presence of past history of psychiatric illness and current presence of psychiatric illness– not significant

Past H/O psychiatric illnesses	Current psychiatric illness		Chi square	P value
	Present	Absent		
Present	2	1	0.588	0.443
Absent	47	59		

ASSOCIATION BETWEEN PSYCHIATRIC ILLNESS AND SUPPORT SYSTEM IN HIV/AIDS DISEASE

In the analysis of support system and psychiatric illness, patients with low support system had statistical significance with presence of psychiatric illness. (chi square = 10.63; P = 0.005). Majority of the patients had high support system and had lower prevalence of psychiatric illness.

Table-22:Association between psychiatric illness and support system in HIV/AIDS disease

Psychiatric illness	**Multidimentional scale of perceived social support**			**Chi Square value**	**P value**
	Low	medium	high		
Absent	3	13	44	**10.63**	**0.005**
Present	10	17	22		

ASSOCIATION BETWEEN PSYCHIATRIC ILLNESS AND FUNCTIONAL ABILITY OF PATIENTS WITH HIV/AIDS DISEASE

In the analysis of functional ability using Karnofsky's performance scale, patients unable to care for self and requires equivalent of institutional or hospital care had statistically significant association with presence of psychiatric illness. (chi square = 22.6; P = <0.001).

Table-23: Association between psychiatric illness and functional ability of patients with HIV/AIDS disease

Psychiatric illness	Karnofsky's performance scale			Chi Square value	P value
	A	B	C		
Absent	56	4	0	**22.6**	**<0.001**
Present	27	15	7		

ASSOCIATION BETWEEN PSYCHIATRIC ILLNESS AND COGNITIVE FUNCTIONING IN HIV/AIDS

In the analysis of cognitive functioning and presence of psychiatric illnesses, no statistically significant association was observed. (Chi square-1.17; P-0.278).

Table-24: Association between psychiatric illness and cognitive functioning in HIV/AIDS disease

Psychiatric illness	Montreal cognitive assessment scale		Chi square test	P value
	Score ≥ 26	Score < 26		
Absent	48	12	1.17	0.278
Present	43	6		

ASSOCIATION BETWEEN PSYCHIATRIC ILLNESS AND TREATMENT ADHERENCE IN HIV/AIDS DISEASE

In the analysis of treatment adherence using Morisky's medication adherence scale – 4, presence of psychiatric illnesses were associated with low treatment adherence in HIV/AIDS, and it is statistically significant (chi sguare-11.45;p-0.003)

Table-25:Association between psychiatric illness and treatment adherence in HIV/AIDS disease

Psychiatric illness	Morisky medication adherence scale 4			Chi square test	P value
	High	Medium	Low		
Absent	42	16	2	**11.45**	**0.003**
Present	21	18	10		

DISCUSSION

DISCUSSION

The total participants in our study were 109. Of these 57 (52.3%) were males, and 49 (45%) were females. Gender ratio varies in the previous studies; some have more male patients than females, while others have more female than male patients. About 70.6% were between 18-44 years, 26.6% were between 45-64 years, and 2.8% were above 65 years of age. About 87.2% belonged to Hindu religion, 3.7% to Muslim, and 9.2% to Christianity. This is consistent with the proportions observed in the general population. About 54.1% had had primary school level education, 17.4% had secondary school level education, 11% had graduate level education, 2.8% had post graduate level education, and 14.7% had had no formal education. About 17.4% were unemployed, 46.8% were unskilled workers, 13.8% were semi-skilled workers, 19.3% were skilled workers and 2.8% were profession. This is consistent with the findings by past study – Naresh Nebhinani et al (2010). Ten (20.40%) of the forty nine females were unemployed, while 9 (15.78%) of the 57 males were unemployed in our study. Most of the study populations (46.8%) were from upper lower socio-economic status. About 33.9% from lower socio-economic status, 12.8% from lower middle socio-economic status, and 6.45% from upper middle socio – economic status. The hospital where our study was done is a urban tertiary care institution that is government run. About 61.5% were living with spouse, 4% were separated, 16.5% were widowed, and 17.4% were single. This finding is similar with the past study – Naresh Nebhinani et

al (2010). Majority were from nuclear families (54.1%), about 42.2% from joint families, and 3.7% from broken families. This only reflects the trend in the general population – majorities are from nuclear families.

About 55% of the patients had a spouse HIV status positive. About 27.5% had spouse HIV status negative and about 17.4% were not known about their spouse HIV status. Duration of illness varied widely – 16.5% were less than one year duration of illness, 25.7% were between 1-5 years, 33% were between 5-10 years, and 24.3% were duration of HIV illness more than 10 years. HIV/AIDS services have improved much in the recent years with better reporting (WHO, Global HIV/AIDS report 2016), which may be one of the reasons for this observation. About mode of transmission, 67% had sexual mode of transmission, 19.3% were not disclosed or not known about mode of transmission, 7.3% had blood transfusion mode of transmission, 4.6% had vertical mode of transmission and 1.8% were injection drug use as mode of transmission. This is consistent with the findings by past study-David J Dausey, et al (2003).

About 20.18% (n=22) had medical co-morbidities, of which Type 2 Diabetes Mellitus was the commonest, being present in 10 people (9.2%). This is comparable to the finding by Karla et al (2011), who observed that the prevalence of Diabetes in HIV patients was 5.7%.

About 45% (n=49) of the study population had at least one psychiatric illness. This is comparable to the findings of previous studies - Naresh Nebhini– 45%, D.M.Israelski, 2007 – 38%, J.A.Ciesla, 2001 – 42%. Depressive disorder was the most common psychiatric morbidity, present in about 21.1% (n=23) of the patients. Among these, 43.4% had mild, 47.8% had moderate, and 8.7% had severe depressive disorders. Others in the past similar prevalence rates – Naresh Nebhini , 2010 – 19%, J.Hampton Atkinson, 1988-17%, and Myer et al,2008 – 14%. Adjustment disorder was the next common morbidity, which was present in about 8.3% (n=9), which is similar to previous study done in india by Naresh Nebhini,2010– 7%

Alcohol dependence syndrome was the next common morbidity, which was present in about 9.2% (n=10) of the patients. Majority (50%) of the patients fell in the risk zone 4 based on AUDIT scores. The prevalence of alcohol dependence syndrome as observed in our study is similar to previous study-Myer et al,2008-7%, and much lower than the prevalence reported in the previous study.- Atkinson et al,1988-22%

About 1.8% (n=2) had nicotine dependence syndrome. This is much lower than the prevalence in the general population which is 24.3% in males in India (WHO report on the global tobacco epidemic, 2015). No other substance use disorders were reported in our study.

Anxiety disorders were the next most common morbidity – present in about 1.8% (n=2) patients. Among these, one patient had mild anxiety, and one

patient had moderate anxiety on Hamilton Anxiety Rating Scale scores. The prevalence of anxiety disorders in our study is much lower than the prevalence reported in the previous studies – Mukesh Shula et al,2016; Sreelekshmi R,2015, who observed a prevalence of 15-40 % for any anxiety disorder.

About 2.8% (n=3) of the total study population had psychosis. This finding was higher than the prevalence reported in previous study- Naresh Nebhini , 2010,who observed a prevalence of less than one percent.

About 2.8% (n=3) of the patients had a past history psychiatric illness, Among these three one had past history alcohol dependence, and was currently abstinent for at least 12 months, other two had past history of depression. The reasons for stopping alcohol use in this patient – worry regarding deteriorating health, poor income due to loss of job.

About 18.3% (n=20) had a family history of psychiatric illness – alcohol dependence-11, Depression-4, psychosis-3, Bipolar affective disorder-1, obsessive compulsive disorder-1. No other psychiatric illness was reported.

Among various socio-demographic factors, male gender was significantly associated with presence of psychiatric illnesses (chi square = 8.02, p=0.018). This is in variance with most studies in the past, which have found either that female or male gender was more associated with psychiatric illness in HIV/AIDS, or that there was no significant difference.

Marital status, single - as opposed to married, widowed, and separated – was significantly associated with presence of psychiatric illnesses (Chi

squared = 15.08, p = 0.002). This is in variance with the findings of Naresh Nebhini (2010), who observed that married was more associated with psychiatric illness. All other variables – age group, religion, education, occupation, family income, socio-economic status – did not reach statistical significance. Past studies show only equivocal results for almost all socio-demographic variables.

Among the HIV/AIDS disease related factors, family history of psychiatry illness was significantly associated with presence of psychiatric illnesses, (chi squared = 6.20, p = 0.013). Stages of HIV (stage 4) were significantly associated with presence of psychiatric illnesses, (chi square=23.2; p= <0.001). CD4 count (less than 2000 was significantly associated with presence of psychiatric illnesses, (chi square=13.48; p=0.004). This finding is similar to G.Lykestos et al:1993, and ART drug adherence (low adherence) was significantly associated with presence of psychiatric illnesses (chi square=11.45;p=.003), This is similar to Yun et al,2005 and Peter s et al,2001 . Shorter duration of illness (Less than one year) has been found to be associated with presence of psychiatric illnesses in our study (chi square=25.98;p= <0.001). This finding is similar to previous studies- Davis et al 1995; Holt et al 1998. All the other factors – spouse HIV status, past history of psychiatry illness, presence of HIV opportunistic infection – were not statistically associated with presence of psychiatric illnesses.

We had find significance in the association between type of ART regimen (Tenofavir + Lamivudine + Efavirenz) and presence of psychiatric illness,(chi square=14.34;p=0.0007). This is in similar with Fumas et al,2005.

We did not find statistical significance in the analysis of association between presence of medical co-morbidities and presence of psychiatric illnesses. This is variance with the findings by Perry et al (1984), who found that medical co morbidities in general increase the risk of psychiatric illness. In our study, diabetes was the most common medical co morbidity, accounting for about 70% of the total medial co-morbidities.

We did find statistical significance in the analysis of association between presence of support system and presence of psychiatric illnesses. Persons had low support system were significantly associated with psychiatric illness,(chi square=10.63;p=0.005).This finding is similar with the findings by Catalan et al, 1995; Katz et al,1996.

We also did find significant association between functional ability and presence of psychiatric illness. Person had low functional ability were significantly associated with psychiatric illness. This is consistent with the findings of Lykestos (2010) and Dilley,J.W (1999).

We did not find statistical significance in the analysis of association between presence of cognitive functioning and presence of psychiatric illnesses. This is variance with the findings by Wolcott,et al (1989);Price,et al,1988;Navia, et al,1986.

Summarising, the prevalence of psychiatric illnesses in the study population was 45%. Depressive disorder was the commonest morbidity (21.1%), followed by alcohol dependence syndrome (9.2%), Adjustment disorder (8.3%), Psychosis (2.8%), and nicotine dependence syndrome (1.8%), and anxiety disorders (1.8%).

Statistically significant associations were observed between the following variables in the study population:

- Male gender and presence of psychiatric illnesses.
- Single and presence of psychiatric illnesses.
- Family history of psychiatry illness and presence of psychiatric illnesses.
- HIV stage 4 and presence of psychiatric illnesses.
- CD4 Count less than 200 and presence of psychiatric illnesses.
- Duration of HIV/AIDS less than one year and presence of psychiatric illnesses.
- Poor ART drug adherence and presence of psychiatric illnesses.
- Low support system and presence of psychiatric illnesses
- Low functional ability and presence of psychiatric illnesses.

CONCLUSION

CONCLUSION

In our study, high prevalence (45%) of psychiatric illnesses in patients with HIV/AIDS has been observed. Psychiatric Comorbidity is associated with poor treatment adherence in general and this is observed in our study also. Addressing the psychiatric illness in this population can lead to significant improvement in treatment adherence and it can improve the outcome of HIV/AIDS.

In our study, Depression is the most common psychiatric morbidity (20 %) followed by alcohol dependence and adjustment disorders and while organizing mental health services for the HIV positive patients this factor should be considered. Depression is easily identifiable and can be easily treated. The prevalence of depression in this population is much higher than that in the general population.

Alcohol dependent individuals tend to lead a chaotic life-style that will interfere with their compliance to treatment. So, Alcohol use in individual with HIV/AIDS should be effectively identified and managed. The association of male gender and single status on psychiatric morbidity is probably due to increased prevalence of alcohol dependence in this population and this group may be considered as a specially vulnerable sub group among those with HIV.

The association between low CD4 count and advanced disease and psychiatric illness indicates the possibility of a vicious cycle of non compliance, illness

progress and psychiatric morbidity which needs to be identified early for intervention.

The association between certain drug regimen and psychiatric comorbidity needs to be analysed further.

An effective liaison services between the physicians treating HIV/AIDS and psychiatric services can improve the adherence to treatment and outcome HIV/AIDS and thereby improve the quality of life of people with HIV/AIDS.

LIMITATIONS OF THE STUDY

Our study is a hospital based, cross sectional, observational study which provides data on prevalence of psychiatric comorbidity. An analytical and longitudinal study may be better suited for conclusion regarding factors associated with psychiatric comorbidity. Participant factors like recall bias may have interfered with certain information. And personality factors were not assessed in our study.

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ANNEXURE

INSTITUTIONAL ETHICS COMMITTEE
GOVT. KILPAUK MEDICAL COLLEGE,
CHENNAI-10
Protocol ID. No. 34/2018 Meeting held on 09.01.2018

The Institutional Ethical Committee of Govt. Kilpauk Medical College, Chennai reviewed and discussed the application for approval "PSYCHIATRY CO-MORBIDITY IN PEPLE WITH HIV/AIDS : A CROSS – SECTIONAL STUDY" submitted by Dr.V.VIJAYAKUMAR, P.G. Student – M.D Psychiatry, Department of Psychiatry, Govt. Kilpauk Medical College, Chennai-10.

The Proposal is **APPROVED.**

The Institutional Ethical Committee expects to be informed about the progress of the study any Adverse Drug Reaction Occurring in the Course of the study any change in the protocol and patient information /informed consent and asks to be provided a copy of the final report.

DEAN
Govt. Kilpauk Medical College,
Chennai-10.

ME 1 Sec> Ethical Committee

INFORMED CONSENT FORM

STUDY: "Psychiatric co-morbidity in people with HIV/AIDS : a cross sectional study".

STUDY CENTRE: ART Center, Govt. Kilpauk Medical College Hospital.

PATIENT'S NAME :

PATIENT'S AGE :

I.P NO. :

Patient may check ( ) these boxes

I confirm that I understood the purpose of the procedure for the above study. ( )

I had the opportunity to ask question and all my questions and doubts have been answered to my complete satisfaction. ( )

I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving reason, without my legal rights being affected. ( )

I understand that the ethical committee members and the regulatory authorities will not need my permission to look at my health records, both in respect of the current study and any further research that may be conducted in relation to it, even if I withdraw from the study I agree to this access. ( )

However, I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. ( )

I agree not to restrict the use of any data or results that arise from the study. ( )

I agree to take part in the above study and to comply with the instructions

given during the study and faithfully co-operate with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or well being or any unexpected or unusual symptoms.( )

I hereby consent to participate in this study. ( )

I hereby give permission to undergo complete clinical examination and diagnostic tests including hematological, biochemical, radiological tests.

( )

Signature / thumb impression

Patient’s name and address:

Place:

Date:

Signature of the investigator:

Study investigator’s name:

Place:

Date:

PARTICIPANTS' INFORMATION SHEET

Investigator : Dr V.Vijayakumar

Name of the participant :

Study title: "Psychiatric Co-morbidity in people with HIV/AIDS : a cross sectional study".

You are invited to take part in this research study. We have got approval from the IEC. You are asked to participate because you satisfy the eligibility criteria.

What is the purpose of this research?

In this study, we aim to assess the prevalence of psychiatric illnesses in people undergoing treatment for HIV/AIDS, the association between psychiatric comorbidity and different sociodemographic factors (age, gender, education) and disease related factors (duration of illness, stages of HIV/AIDS,CD4 count, HIV-TB coinfection), to assess the relationship between psychiatric comorbidity and negative behavioural factors like poor adherence and history of defaulting. This will help in assessing the burden of psychiatric illnesses in people with HIV/AIDS and how it affects the outcome of HIV/AIDS, so that earlier detection and treatment of psychiatric illnesses may improve the outcome of HIV/AIDS.

Benefits:

This study will benefit all people who are undergoing treatment for HIV/AIDS and help improve the drug adherence and follow up rate of HIV/AIDS treatment, and also reduce the incidence of death due to HIV/AIDS.

Discomforts and risks:

No interventional procedure is done in this study.

Confidentiality:

Patients who participate in the study and their details will be maintained confidentially and at any cost, those details will not be let out.

Right to withdraw:

Patients will not be forced to complete the study. At any cost, in such circumstances the treatment will not be compromised.

Signature/Thumb impression of the participant:

Signature of the investigator:

Date :

Place :

சுய ஒப்புதல் படிவம்

ஆய்வு செய்யப்படும் தலைப்பு:

"HIV/AIDS உள்ளவர்களிடம் இருக்கும் மனநோய்களைக் குறித்த ஆராய்ச்சி."

ஆராய்ச்சி நிலையம்: ART CENTER, கீழ்ப்பாக்கம் மருத்துவக்கல்லூரி அரசு மருத்துவமனை, சென்னை.

பங்கு பெறுபவரின் பெயர்:
உறவு முறை:
பங்கு பெறுபவரின் எண்:

பங்கு பெறுபவர் இதனை () குறிக்கவும்

மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களைக் கேட்கவும், அதற்கான தகுந்த விளக்கங்களைப் பெறவும் வாய்ப்பளிக்கப்பட்டது. ( )

நான் இவ்வாய்வில் தன்னிச்சையாகத்தான் பங்கேற்கிறேன். எந்தக் காரணத்தினாலோ எந்தக் கட்டத்திலும் எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகிக் கொள்ளலாம் என்றும் அறிந்து கொண்டேன்.

( )

இந்த ஆய்வு சம்மந்தமாகவும், மேலும் இது சார்ந்த ஆய்வு மேற்கொள்ளும்போதும், இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளைப் பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்துகொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன். ( )

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும், பரிசோதனை முடிவுகளையும் மற்றும் சிகிச்சை தொடர்பான தகவல்களையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக் கொள்ளவும், அதைப் பிரசுரிக்கவும் என் முழு மனதுடன் சம்மதிக்கிறேன்.

( )

இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக்கொள்கிறேன். எனக்குக் கொடுக்கப்பட்ட அறிவுரைகளின் படி நடந்துகொள்வதுடன், இந்த

ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்றும் உறுதியளிக்கிறேன். என் உடல் நலம் பாதிக்கப்பட்டாலோ அல்லது எதிர்பாராத வழக்கத்திற்கு மாறாக நோய்க்குறி தென்பட்டாலோ உடனே அதை மருத்துவ அணியிடம் தெரிவிப்பேன் என உறுதி அளிக்கிறேன்.

( )

இந்த ஆய்வில் எனக்கு மருத்துவப் பரிசோதனை செய்து கொள்ள மற்றும் ஆய்வில் பங்கேற்க நான் முழு மனதுடன் சம்மதிக்கிறேன்.

( )

பங்கேற்பவரின் கையொப்பம் / கட்டைவிரல் ரேகை:

_____

இடம்: _____

தேதி: _____

பங்கேற்பவரின் பெயர் மற்றும் விலாசம்::

ஆய்வாளரின் கையொப்பம் _____

இடம் _____

தேதி _____

ஆய்வாளரின் பெயர் _____

ஆராய்ச்சி தகவல் தாள்

கிழ்பாக்கம் அரசு பொது மருத்துவமனையில் *HIV/AIDS* உள்ளவர்களிடம் இருக்கும் மனநோய்களைக் குறித்து ஆராய்ச்சி செய்ய உள்ளோம். நீங்கள் இந்த ஆராய்ச்சியில் பங்கேற்க நாங்கள் விரும்புகிறோம். இந்த ஆராய்ச்சியில் பங்கேற்பதால் தங்களது நோயின் ஆய்வறிக்கையோ அல்லது சிகிச்சையோ பாதிக்கப்படாது என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியின் முடிவுகளை அல்லது கருத்துகளை வெளியிடும் போதோ அல்லது ஆராய்ச்சியின் போதோ தங்களது பெயரையோ அல்லது அடையாளங்களையோ வெளியிடமாட்டோம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியில் பங்கேற்பது தங்களுடைய விருப்பத்தின் பேரில் தான் இருக்கிறது. மேலும் நீங்கள் எந்நேரமும் இந்த ஆராய்ச்சியில் இருந்து பின்வாங்கலாம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

இந்த சிறப்புப் பரிசோதனைகளின் முடிவுகளை ஆராய்ச்சியின் போதோ அல்லது ஆராய்ச்சியின் முடிவின் போதோ தங்களுக்கு அறிவிப்போம் என்பதையும் தெரிவித்துக்கோள்கிறோம்.

ஆராய்ச்சியாளர் கையொப்பம் பங்கேற்பாளர் கையொப்பம்

தேதி:

PROFORMA

- **Age**
- **Sex**

1) male 2)female 3)transgender

- **Education**

1)illiterate 2)primary level 3)secondary 4)graduate 5)postgraduate

- **Socio economic status**

1) upper 2) upper middle 3) lower middle 4) upper lower 5) lower

- **Religion**

1) Hindu 2)Muslim 3) Christian 4) others

- **Occupation**

1) Unemployed 2) Unskilled worker 3) Semi – skilled worker 4) Skilled worker 5) Profession

- **Marital status**

1) single 2) married 3) widowed 4)separated

- **Spouse HIV status**

1) Positive 2) negative

- **Family type**: 1) nuclear 2) joint 3) broken
- **Family h/o psychiatric illness**: 1)yes 2) no
- **Past h/o psychiatric illness** : 1) YES 2) NO
- **Age at HIV/AIDS diagnosis**:
- **Mode of transmission**

1) sexual 2) injection drug use 3) others 4) blood transfusion 5)vertical transmission 6) not known/not disclosed

- **HIV/AIDS stage**: 1- 2- 3- 4-
- **Treatment modality** : 1) PRE ART 2) ART

- **Treatment Regimen**: 1) tenofavir + lamivudine + efavirenz 2) abacavir+ lamivudine + efavirenz 3) Zidovudine +lamivudine + Nevirapine 4)Tenofavir + lamivudine + nevirapine 5) tenofavir + atazanavir + ritonavir 6)zidovudine + lamivudine + efavirenz 7) Others
- **Duration of illness**: 1)<1 yrs 2) 1-5 yrs 3) 5-10 yrs 4)>10 yrs
- **Co-morbid medical illness**: 1)DM 2)SHT 3)DM + SHT 4) NO 5) Acid peptic disease 6) Jaundice 7) asthma 9) cancer
- **Opportunistic infections** : 1)TB 2)candidiasis 3)Herpes 4) seborrhoric dermatitis 5) angular chelitis 6)no
- **Psychiatric illness**

  1) no 2) Yes : 1)depression 2)adjustment disorder 3)alcohol dependence syndrome 4)anxiety disorder 5)psychosis 6)nicotine dependence syndrome 7) ADS + NDS
  Severity of psychiatric illness:1)Mild 2)Moderate 3)Severe
- **MoCA score:**
- **Treatment adherence**: 1) high 2) medium 3) low
- **MSPSS score** : 1) low support 2) medium 3) high
- **KPS (functional ability):** 1) A 2)B 3)C .

Revised table (Table 1) for scales in 2012 to define socioeconomic status thus obtained is as follows.

Table: 1. Kuppuswamy's Socioeconomic Status Scale

(A) Education Score		
1	**Profession or Honours**	*7*
2	**Graduate or post graduate**	*6*
3	**Intermediate or post high school diploma**	*5*
4	**High school certificate**	*4*
5	**Middle school certificate**	*3*
6	**Primary school certificate**	*2*
7	**Illiterate**	*1*

(B) Occupation Score		
1	**Profession**	*10*
2	**Semi-Profession**	*6*
3	**Clerical, Shop-owner, Farmer**	*5*
4	**Skilled worker**	*4*
5	**Semi-skilled worker**	*3*
6	**Unskilled worker**	*2*
7	**Unemployed**	*1*

(C) Monthly family income in Rs		*Score*	*Modified for 1998* [3] *in* Rs	Modified for 2012 in Rs
1	≥ 2000	*12*	≥ 13500	≥32050
2	1000-1999	*10*	6750 - 13499	*16020 – 32049*
3	750-999	*6*	5050 - 6749	*12020 – 16019*
4	500-749	*4*	3375 - 5049	*8010 – 12019*
5	300-499	*3*	2025 - 3374	*4810 – 8009*
6	101-299	*2*	676 - 2024	*1601 – 4809*
7	≤ 100	*1*	≤ 675	*≤ 1600*

Total Score	Socioeconomic class
26-29	Upper (I)
16-25	Upper Middle (II)
11-15	Middle/Lower middle (III)
5-10	Lower/Upper lower (IV)
<5	Lower (V)

Name_____ ID# _____Date _____

SCL-90

Below is a list of problems and complaints that people sometimes have. Please read each one carefully. After you have done so, select one of the numbered descriptors that best describes HOW MUCH THAT PROBLEM HAS BOTHERED OR DISTRESSED YOU DURING THE PAST WEEK, INCLUDING TODAY. Circle the number in the space to the right of the problem and do not skip any items. Use the following key to guide how you respond:

Circle 0 if your answer is NOT AT ALL
Circle 1 if A LITTLE BIT
Circle 2 if MODERATELY
Circle 3 if QUITE A BIT
Circle 4 if EXTREMELY

Please read the following example before beginning:

Example: In the previous week, how much were you bothered by:

Backaches 0 (1) 2 3 4

In this case, the respondent experienced backaches a little bit (1).
Please proceed with the questionnaire.

HOW MUCH WERE YOU BOTHERED BY:		NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
1.	Headaches	0	1	2	3	4
2.	Nervousness or shakiness inside	0	1	2	3	4
3.	Unwanted thoughts, words, or ideas that won't leave your mind	0	1	2	3	4
4.	Faintness or dizziness	0	1	2	3	4
5.	Loss of sexual interest or pleasure	0	1	2	3	4
6.	Feeling critical of others	0	1	2	3	4
7.	The idea that someone else can control your thoughts	0	1	2	3	4
8.	Feeling others are to blame for most of your troubles	0	1	2	3	4
9.	Trouble remembering things	0	1	2	3	4
10.	Worried about sloppiness or carelessness	0	1	2	3	4
11.	Feeling easily annoyed or irritated	0	1	2	3	4
12.	Pains in heart or chest	0	1	2	3	4
13.	Feeling afraid in open spaces or on the streets	0	1	2	3	4
14.	Feeling low in energy or slowed down	0	1	2	3	4
15.	Thoughts of ending your life	0	1	2	3	4
16.	Hearing voices that other people do not hear	0	1	2	3	4
17.	Trembling	0	1	2	3	4
18.	Feeling that most people cannot be trusted	0	1	2	3	4
19.	Poor appetite	0	1	2	3	4

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SCL-90 (*continued*)

HOW MUCH WERE YOU BOTHERED BY:		NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
20.	Crying easily	0	1	2	3	4
21.	Feeling shy or uneasy with the opposite sex	0	1	2	3	4
22.	Feeling of being trapped or caught	0	1	2	3	4
23.	Suddenly scared for no reason	0	1	2	3	4
24.	Temper outbursts that you could not control	0	1	2	3	4
25.	Feeling afraid to go out of your house alone	0	1	2	3	4
26.	Blaming yourself for things	0	1	2	3	4
27.	Pains in lower back	0	1	2	3	4
28.	Feeling blocked in getting things done	0	1	2	3	4
29.	Feeling lonely	0	1	2	3	4
30.	Feeling blue	0	1	2	3	4
31.	Worrying too much about things	0	1	2	3	4
32.	Feeling no interest in things	0	1	2	3	4
33.	Feeling fearful	0	1	2	3	4
34.	Your feelings being easily hurt	0	1	2	3	4
35.	Other people being aware of your private thoughts	0	1	2	3	4
36.	Feeling others do not understand you or are unsympathetic	0	1	2	3	4
37.	Feeling that people are unfriendly or dislike you	0	1	2	3	4
38.	Having to do things very slowly to insure correctness	0	1	2	3	4
39.	Heart pounding or racing	0	1	2	3	4
40.	Nausea or upset stomach	0	1	2	3	4
41.	Feeling inferior to others	0	1	2	3	4
42.	Soreness of your muscles	0	1	2	3	4
43.	Feeling that you are watched or talked about by others	0	1	2	3	4
44.	Trouble falling asleep	0	1	2	3	4
45.	Having to check and double-check what you do	0	1	2	3	4
46.	Difficulty making decisions	0	1	2	3	4
47.	Feeling afraid to travel on buses, subways, trains	0	1	2	3	4
48.	Trouble getting your breath	0	1	2	3	4
49.	Hot or cold spells	0	1	2	3	4
50.	Having to avoid certain things, places, or activities because they frighten you	0	1	2	3	4
51.	Your mind going blank	0	1	2	3	4
52.	Numbness or tingling in parts of your body	0	1	2	3	4
53.	A lump in your throat	0	1	2	3	4
54.	Feeling hopeless about the future	0	1	2	3	4
55.	Trouble concentrating	0	1	2	3	4

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SCL-90 (*continued*)

HOW MUCH WERE YOU BOTHERED BY:		NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
56.	Feeling weak in parts of your body	0	1	2	3	4
57.	Feeling tense or keyed up	0	1	2	3	4
58.	Heavy feelings in your arms or legs	0	1	2	3	4
59.	Thoughts of death or dying	0	1	2	3	4
60.	Overeating	0	1	2	3	4
61.	Feeling uneasy when people are watching or talking about you	0	1	2	3	4
62.	Having thoughts that are not your own	0	1	2	3	4
63.	Having urges to beat, injure, or harm someone	0	1	2	3	4
64.	Awakening in the early morning	0	1	2	3	4
65.	Having to repeat the same actions such as touching, counting, washing	0	1	2	3	4
66.	Sleep that is restless or disturbed	0	1	2	3	4
67.	Having urges to break or smash things	0	1	2	3	4
68.	Having ideas or beliefs that others do not share	0	1	2	3	4
69.	Feeling very self-conscious with others	0	1	2	3	4
70.	Feeling uneasy in crowds, such as shopping or at a movie	0	1	2	3	4
71.	Feeling everything is an effort	0	1	2	3	4
72.	Spells of terror or panic	0	1	2	3	4
73.	Feeling uncomfortable about eating or drinking in public	0	1	2	3	4
74.	Getting into frequent arguments	0	1	2	3	4
75.	Feeling nervous when you are left alone	0	1	2	3	4
76.	Others not giving you proper credit for your achievements	0	1	2	3	4
77.	Feeling lonely even when you are with people	0	1	2	3	4
78.	Feeling so restless you couldn't sit still	0	1	2	3	4
79.	Feelings of worthlessness	0	1	2	3	4
80.	Feeling that familiar things are strange or unreal	0	1	2	3	4
81.	Shouting or throwing things	0	1	2	3	4
82.	Feeling afraid you will faint in public	0	1	2	3	4
83.	Feeling that people will take advantage of you if you let them	0	1	2	3	4
84.	Having thoughts about sex that bother you a lot	0	1	2	3	4
85.	The idea that you should be punished for your sins	0	1	2	3	4
86.	Feeling pushed to get things done	0	1	2	3	4
87.	The idea that something serious is wrong with your body	0	1	2	3	4
88.	Never feeling close to another person	0	1	2	3	4
89.	Feelings of guilt	0	1	2	3	4
90.	The idea that something is wrong with your mind	0	1	2	3	4

Reference: Derogatis, L.R., Lipman, R.S., & Covi, L. (1973). SCL-90: An outpatient psychiatric rating scale—Preliminary Report. *Psychopharmacol. Bull. 9*, 13–28.

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HAMILTON DEPRESSION RATING SCALE (HAM-D)

(To be administered by a health care professional)

Patient Name _____ Today's Date _____

The HAM-D is designed to rate the severity of depression in patients. Although it contains 21 areas, calculate the patient's score on the first 17 answers.

☐ 1. DEPRESSED MOOD
(Gloomy attitude, pessimism about the future, feeling of sadness, tendency to weep)
0 = Absent
1 = Sadness, etc.
2 = Occasional weeping
3 = Frequent weeping
4 = Extreme symptoms

☐ 2. FEELINGS OF GUILT
0 = Absent
1 = Self-reproach, feels he/she has let people down
2 = Ideas of guilt
3 = Present illness is a punishment; delusions of guilt
4 = Hallucinations of guilt

☐ 3. SUICIDE
0 = Absent
1 = Feels life is not worth living
2 = Wishes he/she were dead
3 = Suicidal ideas or gestures
4 = Attempts at suicide

☐ 4. INSOMNIA - Initial
(Difficulty in falling asleep)
0 = Absent
1 = Occasional
2 = Frequent

☐ 5. INSOMNIA - Middle
(Complains of being restless and disturbed during the night. Waking during the night.)
0 = Absent
1 = Occasional
2 = Frequent

☐ 6. INSOMNIA - Delayed
(Waking in early hours of the morning and unable to fall asleep again)
0 = Absent
1 = Occasional
2 = Frequent

☐ 7. WORK AND INTERESTS
0 = No difficulty
1 = Feelings of incapacity, listlessness, indecision and vacillation
2 = Loss of interest in hobbies, decreased social activities
3 = Productivity decreased
4 = Unable to work. Stopped working because of present illness only. (Absence from work after treatment or recovery may rate a lower score).

☐ 8. RETARDATION
(Slowness of thought, speech, and activity; apathy; stupor.)
0 = Absent
1 = Slight retardation at interview
2 = Obvious retardation at interview
3 = Interview difficult
4 = Complete stupor

☐ 9. AGITATION
(Restlessness associated with anxiety.)
0 = Absent
1 = Occasional
2 = Frequent

☐ 10. ANXIETY - PSYCHIC
0 = No difficulty
1 = Tension and irritability
2 = Worrying about minor matters
3 = Apprehensive attitude
4 = Fears

HAMILTON DEPRESSION RATING SCALE (HAM-D)

(To be administered by a health care professional)

☐ 11. ANXIETY - SOMATIC

Gastrointestinal, indigestion
Cardiovascular, palpitation, Headaches
Respiratory, Genito-urinary, etc.

0 = Absent
1 = Mild
2 = Moderate
3 = Severe
4 = Incapacitating

☐ 12. SOMATIC SYMPTOMS - GASTROINTESTINAL

(Loss of appetite , heavy feeling in abdomen; constipation)

0 = Absent
1 = Mild
2 = Severe

☐ 13. SOMATIC SYMPTOMS - GENERAL

(Heaviness in limbs, back or head; diffuse backache; loss of energy and fatiguability)

0 = Absent
1 = Mild
2 = Severe

☐ 14. GENITAL SYMPTOMS

(Loss of libido, menstrual disturbances)

0 = Absent
1 = Mild
2 = Severe

☐ 15. HYPOCHONDRIASIS

0 = Not present
1 = Self-absorption (bodily)
2 = Preoccupation with health
3 = Querulous attitude
4 = Hypochondriacal delusions

☐ 16. WEIGHT LOSS

0 = No weight loss
1 = Slight
2 = Obvious or severe

☐ 17. INSIGHT

(Insight must be interpreted in terms of patient's understanding and background.)

0 = No loss
1 = Partial or doubtfull loss
2 = Loss of insight

TOTAL ITEMS 1 TO 17: _____

0 - 7 = Normal
8 - 13 = Mild Depression
14-18 = Moderate Depression
19 - 22 = Severe Depression
≥ 23 = Very Severe Depression

☐ 18. DIURNAL VARIATION

(Symptoms worse in morning or evening. Note which it is.)

0 = No variation
1 = Mild variation; AM ( ) PM ( )
2 = Severe variation; AM ( ) PM ( )

☐ 19. DEPERSONALIZATION AND DEREALIZATION

(feelings of unreality, nihilistic ideas)

0 = Absent
1 = Mild
2 = Moderate
3 = Severe
4 = Incapacitating

☐ 20. PARANOID SYMPTOMS

(Not with a depressive quality)

0 = None
1 = Suspicious
2 = Ideas of reference
3 = Delusions of reference and persecution
4 = Hallucinations, persecutory

☐ 21. OBSESSIONAL SYMPTOMS

(Obsessive thoughts and compulsions against which the patient struggles)

0 = Absent
1 = Mild
2 = Severe

---

* Adapted from Hamilton, M. *Journal of Neurology, Neurosurgery, and Psychiatry*. 23:56-62, 1960.

Hamilton Anxiety Rating Scale (HAM-A)

Below is a list of phrases that describe certain feeling that people have. Rate the patients by finding the answer which best describes the extent to which he/she has these conditions. Select one of the five responses for each of the fourteen questions.

0 = Not present, 1 = Mild, 2 = Moderate, 3 = Severe, 4 = Very severe.

1 Anxious mood [0] [1] [2] [3] [4]

Worries, anticipation of the worst, fearful anticipation, irritability.

2 Tension [0] [1] [2] [3] [4]

Feelings of tension, fatigability, startle response, moved to tears easily, trembling, feelings of restlessness, inability to relax.

3 Fears [0] [1] [2] [3] [4]

Of dark, of strangers, of being left alone, of animals, of traffic, of crowds.

4 Insomnia [0] [1] [2] [3] [4]

Difficulty in falling asleep, broken sleep, unsatisfying sleep and fatigue on waking, dreams, nightmares, night terrors.

5 Intellectual [0] [1] [2] [3] [4]

Difficulty in concentration, poor memory.

6 Depressed mood [0] [1] [2] [3] [4]

Loss of interest, lack of pleasure in hobbies, depression, early waking, diurnal swing.

7 Somatic (muscular) [0] [1] [2] [3] [4]

Pains and aches, twitching, stiffness, myoclonic jerks, grinding of teeth, unsteady voice, increased muscular tone.

8 Somatic (sensory) [0] [1] [2] [3] [4]

Tinnitus, blurring of vision, hot and cold flushes, feelings of weakness, pricking sensation.

9 Cardiovascular symptoms [0] [1] [2] [3] [4]

Tachycardia, palpitations, pain in chest, throbbing of vessels, fainting feelings, missing beat.

10 Respiratory symptoms [0] [1] [2] [3] [4]

Pressure or constriction in chest, choking feelings, sighing, dyspnea.

11 Gastrointestinal symptoms [0] [1] [2] [3] [4]

Difficulty in swallowing, wind abdominal pain, burning sensations, abdominal fullness, nausea, vomiting, borborygmi, looseness of bowels, loss of weight, constipation.

12 Genitourinary symptoms [0] [1] [2] [3] [4]

Frequency of micturition, urgency of micturition, amenorrhea, menorrhagia, development of frigidity, premature ejaculation, loss of libido, impotence.

13 Autonomic symptoms [0] [1] [2] [3] [4]

Dry mouth, flushing, pallor, tendency to sweat, giddiness, tension headache, raising of hair.

14 Behavior at interview [0] [1] [2] [3] [4]

Fidgeting, restlessness or pacing, tremor of hands, furrowed brow, strained face, sighing or rapid respiration, facial pallor, swallowing, etc.

The Alcohol Use Disorders Identification Test: Interview Version

Read questions as written. Record answers carefully. Begin the AUDIT by saying "Now I am going to ask you some questions about your use of alcoholic beverages during this past year." Explain what is meant by "alcoholic beverages" by using local examples of beer, wine, vodka, etc. Code answers in terms of "standard drinks". Place the correct answer number in the box at the right.

1. How often do you have a drink containing alcohol?

   (0) Never [Skip to Qs 9-10]
   (1) Monthly or less
   (2) 2 to 4 times a month
   (3) 2 to 3 times a week
   (4) 4 or more times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

   (0) 1 or 2
   (1) 3 or 4
   (2) 5 or 6
   (3) 7, 8, or 9
   (4) 10 or more

3. How often do you have six or more drinks on one occasion?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

   Skip to Questions 9 and 10 if Total Score for Questions 2 and 3 = 0

4. How often during the last year have you found that you were not able to stop drinking once you had started?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

5. How often during the last year have you failed to do what was normally expected from you because of drinking?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

   (0) No
   (2) Yes, but not in the last year
   (4) Yes, during the last year

10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?

    (0) No
    (2) Yes, but not in the last year
    (4) Yes, during the last year

Record total of specific items here

If total is greater than recommended cut-off, consult User's Manual.

Fagerstrom Test for Nicotine Dependence

	PLEASE TICK (✓) ONE BOX FOR EACH QUESTION	
How soon after waking do you smoke your first cigarette?	Within 5 minutes 5-30 minutes 31-60 minutes	☐ 3 ☐ 2 ☐ 1
Do you find it difficult to refrain from smoking in places where it is forbidden? e.g. Church, Library, etc.	Yes No	☐ 1 ☐ 0
Which cigarette would you hate to give up?	The first in the morning Any other	☐ 1 ☐ 0
How many cigarettes a day do you smoke?	10 or less 11 – 20 21 – 30 31 or more	☐ 0 ☐ 1 ☐ 2 ☐ 3
Do you smoke more frequently in the morning?	Yes No	☐ 1 ☐ 0
Do you smoke even if you are sick in bed most of the day?	Yes No	☐ 1 ☐ 0
	Total Score	
SCORE	1- 2 = low dependence 3-4 = low to mod dependence	5 - 7= moderate dependence 8 + = high dependence

Add up the scores from the questionnaire.

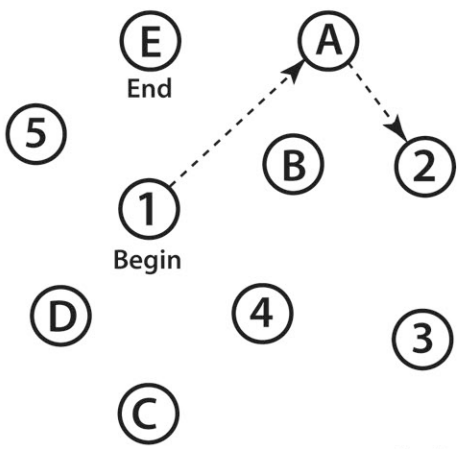
Information about scoring the Test is on the next page.

MONTREAL COGNITIVE ASSESSMENT (MOCA)

Version 7.1 Original Version

NAME :
Education : Date of birth :
Sex : DATE :

VISUOSPATIAL / EXECUTIVE



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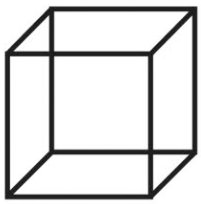


Copy cube

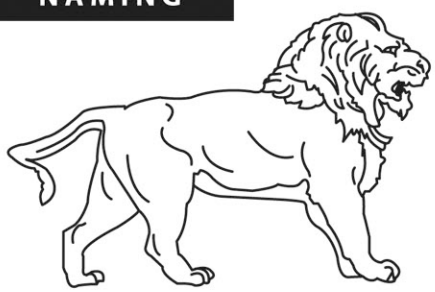
[ ]

Draw CLOCK (Ten past eleven)
(3 points)

[ ] Contour [ ] Numbers [ ] Hands

POINTS ___/5

NAMING



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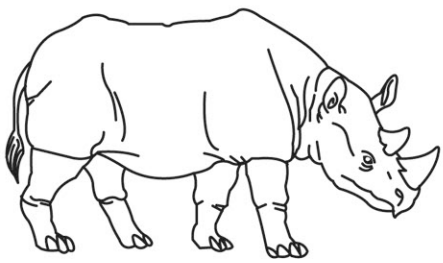

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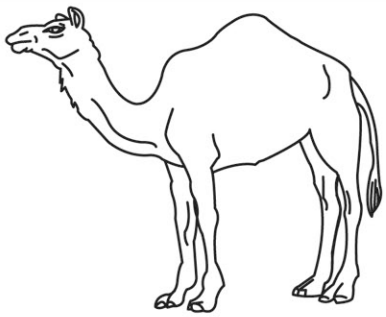

[ ]

___/3

MEMORY

Read list of words, subject must repeat them. Do 2 trials, even if 1st trial is successful. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

No points

ATTENTION

Read list of digits (1 digit/ sec.). Subject has to repeat them in the forward order [ ] 2 1 8 5 4

Subject has to repeat them in the backward order [ ] 7 4 2

___/2

Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors

[ ] F B A C M N A A J K L B A F A K D E A A A J A M O F A A B

___/1

Serial 7 subtraction starting at 100 [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65

4 or 5 correct subtractions: **3 pts**, 2 or 3 correct: **2 pts**, 1 correct: **1 pt**, 0 correct: **0 pt**

___/3

LANGUAGE

Repeat : I only know that John is the one to help today. [ ]

The cat always hid under the couch when dogs were in the room. [ ]

___/2

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] _____ (N ≥ 11 words)

___/1

ABSTRACTION

Similarity between e.g. banana - orange = fruit [ ] train – bicycle [ ] watch - ruler

___/2

DELAYED RECALL

Optional

	FACE	VELVET	CHURCH	DAISY	RED
Has to recall words **WITH NO CUE**	[ ]	[ ]	[ ]	[ ]	[ ]
Category cue					
Multiple choice cue					

Points for UNCUED recall only

___/5

ORIENTATION

[ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City

___/6

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www.mocatest.org

Normal ≥ 26 / 30

TOTAL ___/30

Add 1 point if ≤ 12 yr edu

Administered by: _____

Morisky 8-Item Medication Adherence Questionnaire

Question	Patient Answer (Yes/No)	Score Y=1; N=0
Do you sometimes forget to take your medicine?		
People sometimes miss taking their medicines for reasons other than forgetting. Thinking over the past 2 weeks, were there any days when you did not take your medicine?		
Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?		
When you travel or leave home, do you sometimes forget to bring along your medicine?		
Did you take all your medicines yesterday?		
When you feel like your symptoms are under control, do you sometimes stop taking your medicine?		
Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?		
How often do you have difficulty remembering to take all your medicine? __ A. Never/rarely __ B. Once in a while __ C. Sometimes __ D. Usually __ E. All the time		A = 0; B-E = 1
	Total score	

Scores: >2 = low adherence
1 or 2 = medium adherence
0 = high adherence

Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. *Med Care.* 1986;24:67-74.

The Karnofsky Performance Scale Index allows patients to be classified as to their functional impairment. This can be used to compare effectiveness of different therapies and to assess the prognosis in individual patients. The lower the Karnofsky score, the worse the survival for most serious illnesses.

KARNOFSKY PERFORMANCE STATUS SCALE DEFINITIONS RATING (%) CRITERIA

Able to carry on normal activity and to work; no special care needed.	100	Normal no complaints; no evidence of disease.
	90	Able to carry on normal activity; minor signs or symptoms of disease.
	80	Normal activity with effort; some signs or symptoms of disease.
Unable to work; able to live at home and care for most personal needs; varying amount of assistance needed.	70	Cares for self; unable to carry on normal activity or to do active work.
	60	Requires occasional assistance, but is able to care for most of his personal needs.
	50	Requires considerable assistance and frequent medical care.
Unable to care for self; requires equivalent of institutional or hospital care; disease may be progressing rapidly.	40	Disabled; requires special care and assistance.
	30	Severely disabled; hospital admission is indicated although death not imminent.
	20	Very sick; hospital admission necessary; active supportive treatment necessary.
	10	Moribund; fatal processes progressing rapidly.
	0	Dead

References:

Crooks, V, Waller S, et al. The use of the Karnofsky Performance Scale in determining outcomes and risk in geriatric outpatients. J Gerontol. 1991; 46: M139-M144.

de Haan R, Aaronson A, et al. Measuring quality of life in stroke. Stroke. 1993; 24:320- 327.

Hollen PJ, Gralla RJ, et al. Measurement of quality of life in patients with lung cancer in multicenter trials of new therapies. Cancer. 1994; 73: 2087-2098.

O'Toole DM, Golden AM. Evaluating cancer patients for rehabilitation potential. West J Med. 1991; 155:384-387.

Oxford Textbook of Palliative Medicine, Oxford University Press. 1993;109.

Schag CC, Heinrich RL, Ganz PA. Karnofsky performance status revisited: Reliability, validity, and guidelines. J Clin Oncology. 1984; 2:187-193.

Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet & Farley, 1988)

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Circle the "1" if you **Very Strongly Disagree**
Circle the "2" if you **Strongly Disagree**
Circle the "3" if you **Mildly Disagree**
Circle the "4" if you are **Neutral**
Circle the "5" if you **Mildly Agree**
Circle the "6" if you **Strongly Agree**
Circle the "7" if you **Very Strongly Agree**

1.	There is a special person who is around when I am in need.	1	2	3	4	5	6	7	SO
2.	There is a special person with whom I can share my joys and sorrows.	1	2	3	4	5	6	7	SO
3.	My family really tries to help me.	1	2	3	4	5	6	7	Fam
4.	I get the emotional help and support I need from my family.	1	2	3	4	5	6	7	Fam
5.	I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7	SO
6.	My friends really try to help me.	1	2	3	4	5	6	7	Fri
7.	I can count on my friends when things go wrong.	1	2	3	4	5	6	7	Fri
8.	I can talk about my problems with my family.	1	2	3	4	5	6	7	Fam
9.	I have friends with whom I can share my joys and sorrows.	1	2	3	4	5	6	7	Fri
10.	There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7	SO
11.	My family is willing to help me make decisions.	1	2	3	4	5	6	7	Fam
12.	I can talk about my problems with my friends.	1	2	3	4	5	6	7	Fri

The items tended to divide into factor groups relating to the source of the social support, namely family (Fam), friends (Fri) or significant other (SO).

MASTER CHART

s.no	age	sex	educ	ses	religion	occup	marietal status	spouse.s	fam.type	familyh/o	pasth/o	age at diag	mode of trans	HIV stage	CD4 count	treatment	treat.regimen	duration of treat	comorbidity	opp.infec	psych.illness	types of illness	severity	MOCA	Adherence	mpss	kps
1	42	2	2	4	3	2	1	1	1	2	2	35	1	1	1	2	1	2	1	6	1			24	2	2	1
2	25	1	4	3	1	4	2		2	2	2	24	1	1	1	2	1	1	4	6	2	1	3	29	1	1	1
3	40	2	3	4	1	2	1	1	1	2	2	27	1	1	1	2	5	4	4	6	2	1	1	24	1	2	1
4	37	2	2	4	1	2	1	2	1	2	2	25	6	1	1	2	1	4	4	6	1			22	1	2	1
5	39	2	2	4	1	3	1	1	1	2	2	29	1	1	1	2	3	4	4	6	2	1	1	18	1	3	1
6	44	2	2	4	1	2	3	1	1	2	2	31	1	1	2	2	1	4	4	6	1			24	1	2	1
7	37	1	2	5	1	2	1	1	1	2	2	25	6	1	2	2	3	4	4	6	1			23	1	2	1
8	42	1	2	4	1	4	1	1	2	2	2	28	1	2	3	2	1	4	6	6	2	3	3	15	2	1	2
9	17	1	3	4	1	2	2		2	2	2	8	5	3	3	2	3	3	4	1	1			26	2	2	1
10	43	2	2	4	3	2	3	1	1	2	2	42	1	3	3	2	1	1	4	1	2	1	1	27	1	2	1
11	34	2	3	2	3	2	1	2	1	2	2	24	4	1	1	2	1	3	4	6	1			27	1	3	1
12	24	3	2	5	1	1	2		2	2	1	20	1	2	3	2	1	2	4	3	2	3	3	23	3	1	2
13	34	1	2	3	1	4	2		1	2	2	33	1	1	1	2	1	2	4	6	2	3	3	28	1	3	1
14	60	2	2	5	1	2	3	1	2	2	2	60	4	1	2	2	1	1	4	6	1			23	1	3	1
15	45	2	2	4	1	2	1	1	1	2	2	35	1	1	1	2	4	3	4	6	2	2	1	25	1	2	2
16	53	1	4	2	1	4	1	1	1	1	2	43	1	1	1	2	1	3	1	6	1			27	1	3	1
17	50	1	2	4	1	4	1	2	1	2	2	47	1	1	2	2	1	2	4	6	1			25	1	1	1
18	51	2	2	4	1	1	3	1	2	2	2	36	1	1	1	2	3	4	4	6	1			21	1	3	1
19	30	1	4	2	1	5	2		2	2	2	27	1	1	1	2	1	2	4	6	2	2	1	29	1	2	1
20	31	1	5	2	1	4	2		2	2	2	30	1	3	3	2	1	1	2	1	2	1	2	26	1	2	1
21	25	1	2	4	1	3	2		2	1	2	12	5	3	4	2	1	2	4	1	2	1	2	22	2	1	2
22	63	2	2	5	1	2	1	2	2	2	2	62	6	1	2	2	1	2	4	6	1			22	1	3	1
23	38	1	2	4	1	2	4	1	1	1	2	33	1	1	2	2	3	3	4	6	1			24	1	2	1
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