ANEMIA AND ASSOCIATED FACTORS AMONG ADULT PSYCHIATRIC PATIENTS IN JIMMA MEDICAL CENTER, JIMMA, SOUTHWEST ETHIOPIA

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ABSTRACT

***Background**: Anemia is the reduction in red cell mass and /or hemoglobin, resulting in the body's inability to maintain the oxygen requirements which results in tissue hypoxia. Among the causes of anemia iron deficiency has a significant influence on cognitive development, intelligence, and developmental delay. Anemia is multi factorial and also associated with an increased risk of depression and other psychiatric disorders.*

***Objectives**: To determine the prevalence of anemia and associated factors among adult psychiatric patients in Jimma Medical Center Jimma, Southwest Ethiopia.*

Methods: *A facility based cross-sectional study was conducted among adult psychiatric patients who were on continuous follow up from April 10 -June 10, 2018, at psychiatric clinic in Jimma. Socio-demographic characteristics, clinical data and nutritional habit, were collected using a structured questionnaire based interview. Four (4) milliliter of EDTA anti coagulated venous blood was collected and analyzed for CBC by **HUMACOUNT® 30^{TS}** (Wiesbaden Germany) and stool specimen was collected and examined for intestinal parasites. Data were analyzed using SPSS version 20. Both bivariate and multi variate was performed. A p-value <0.05 was considered as statically significant.*

***Result: -**A total of 396 study participants were involved in the study. The overall prevalence of anemia among adult psychiatric patients was 11.9 % (47/396). The mean age of the study participants was 30.57 $\pm$7.03 years and the mean hemoglobin level was15.15 $\pm$1.94 g/dl. The frequency of anemia was higher among female 13.5% (n=15), patients with bi polar disorder (13.8%), illiterate 14.2 %(n=23), un employed 13.2 %(n=32), rural residence is 14 % (n=33). Having intestinal parasite (p<0.001, AOR=6.535(3.193-13.373) and not eating green vegetable regularly (p=0.023, AOR=2.195, 95%CI (1.113-3.331) were significantly associated with anemia.*

***Conclusion and Recommendations:-** The overall prevalence of anemia among adult psychiatric patients was 11.9 % (47/396) which is found according to WHO (2011) classifications of public health significance of anemia between (5.0-19.9%) indicated that mild. Having intestinal parasite (p<0.001, AOR=6.535(3.193-13.373) and not eating green vegetable regularly (p=0.023, AOR=2.195, 95%CI (1.113-3.331) were significantly associated with anemia.*

Keyword: Anemia, psychiatric Patients, Risk factors, Southwest Ethiopia, Jimma

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List of abbreviation and acronyms

BF	Blood Film
CBC	Complete Blood Count
DALY	Disability Adjusted Life Year
HCT	Hematocrit
HGB	Hemoglobin
CI	Confidence Interval
HIV	Human immune Deficiency Virus
IDA	Iron Deficiency Anemia
IP	Intestinal Parasites
JMC	Jimma Medical Center
LMIC	Lower and Middle Income Country
QA	Quality Assurance
QC	Quality Control
SOPS	Standard Operating Procedures
WHO	World Health Organization

Operational Definitions

- **Anemia:** A hemoglobin value below 130 g/l in men, and below 120 g/l in women.
- **Adult :** A person whose age greater or equal to 18
- **BMI:** <18,18.5-24.99 kg/m^2,25-29.99kg/m^2,>30kg/m^2 indicates that underweight, normal weight, over weight and obesity respectively.
- **Anemia** classified as based on red cell indices-microcytic hypochromic (MCV<80fl, MCH<27pg, Macrocytic (MCV>100fl) and normocytic normochromic (80fl <MCV <100fl,MCH>32pg.

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CHAPTER ONE:-INTRODUCTION

1.1. Background Information

Anemia is a condition characterized by a reduction in the red blood cell count or in the concentration of hemoglobin. Anemia is not a disease; it is a manifestation of various diseases and pathologic conditions (1).Hemoglobin (Hgb) is an iron-containing transport protein that carries oxygen in the blood stream from respiratory organs (lungs) to the rest of the body. As a result of the depletion of RBCs (Red blood cells) and /or Hgb, anemia will result a decrease in the oxygen-binding ability of hemoglobin molecules which results tissue hypoxia (2).

Anemia constitutes a public health problem in developing countries. Worldwide, about 2 billion people are estimated to suffer from anemia and it is reported to account for three-quarters of 1 million deaths a year in Africa and South-East Asia (3).Anemia is the result of a wide variety of causes that can be isolated, but more often coexist. Globally, the most significant contributor to the onset of anemia is iron deficiency anemia. Among the other causes of anemia, heavy blood loss as a result of menstruation or parasite infections such as *Hook-worms, Ascaris* and *Schistosomiasis* can lower blood hemoglobin (Hgb) concentrations. Acute and chronic infections including malaria, tuberculosis, and Human immunodeficiency virus(HIV)can also lower blood Hgb concentrations. The presence of other micro-nutrient deficiencies, including vitamins A and B12, folate, riboflavin, and copper can increase the risk of anemia (4).

Anemia often goes undetected as symptoms can be small and vague. Most commonly reported symptoms include: weakness or fatigue general malaise (feeling unwell),poor or inability of concentration, pallor(pale skin, mucosallinings and nail beds),pica (consumption of ice, hair, paper, etc.),shortness of breath on exertion, palpitations and sweatiness(5).

The consequences of anemia can be quite severe and are often irreversible, affecting both individual and socio economic health of individuals and families. Mild to moderate anemia leads to weakened immunity, reduced work capacity, reduced cognitive ability and an overall decreased quality of life. Severe anemia (Hgb<70g/L) causes delayed cognitive development and limitation in intellectual development is also a major concern in children and adolescents (6).

Iron has an important role in neurologic functions and developments. It is required for proper myelination of the spinal cord and brain white matter of cerebellar folds, and it is a cofactor for a number of enzymes involved in neurotransmitter synthesis, such as tryptophan hydroxylase (serotonin) and tyrosine hydroxylase (norepinephrine and dopamine)(7).

Iron deficiency anemia(IDA) were significantly associated with an alteration of monoamine neurotransmitters and the abnormal myelination of white matter, and is probably related to childhood/adolescence-onset psychiatric disorders. And also it has a significant influence on cognitive development, intelligence, and developmental delay (8).

Furthermore iron deficiency anemia contributed to common mental disorder (CMD) symptoms. The potential mechanisms of this effect are not well understood, but it is hypothesized that it alters myelination and neurotransmitter metabolism and function, which in turn contributes to depressive symptoms including fatigue, irritability, apathy, and an inability to concentrate(9).

For the diagnosis of anemia complete blood count (CBC)is most commonly used. It identifies several different parameters and can provide a great deal of information. The fundamental parameters of CBC such as Hgb concentration, RBC, Hematocrit (Hct), mean cell volume (MCV), mean Corpuscular hemoglobin (MCH), mean cell hemoglobin concentration (MCHC), and red blood cell distribution width (RDW) play an important role in the diagnosis and monitoring of anemic patient(10).

1.2 Statement of the Problem

The world is suffering from an increasing burden of mental disorders and about 450 million people suffering from a mental or behavioral disorder. It ranked in the top 20 leading causes of Disability adjusted life years (DALYs) for all ages and in the top 6 in the age group 15-44 years(4).And also nearly 25% of individuals develop one or more mental or behavioral disorders at some stage in their life, in both developed and developing countries and one-third of all years lived with disability worldwide can be attributed to neuropsychiatric conditions (11).Anemia ,one of the commonest hematological complications in psychiatric patients, refers to the condition in which the hemoglobin content of the blood is lower than normal for a person's age, gender ,environment, resulting in the oxygen carrying capacity of the blood being reduced(12).

Anemia is a global public health problem associated with increased mortality and morbidity. The highest prevalence of anemia exists in the developing world (13).The global prevalence of anemia for the general population is 24.8% and it is estimated that 1620 million people are affected by anemia (14). The prevalence of anemia varies significantly by sex and age with an estimated prevalence in the most vulnerable populations ranging from 47% in pre-school children (PSC), 42% in pregnant women, 30% in non-pregnant women, and25% in school age children (SAC) (15).

According to the World Health Organization, iron deficiency (ID) is the most prevalent nutritional deficiency. A 30% prevalence of iron deficiency anemia (IDA), at a minimum, has been noted among children, adolescents, and women in non-industrialized countries (16-19).And also IDA affects most of the 3.5 billion people in developing countries. It is the most current cause of anemia in different age groups, including women of reproductive age. Decreased productivity, decreased academic performance, immune system disorders and neural dysfunction in vulnerable groups is adverse consequences of IDA(20).

Psychiatric manifestations can occur in the presence of low serum B12 levels (18). A wide variety of psychiatric disorders which have been associated with deficiency of vitamin B12 include dementia, depression, psychosis, schizophrenia, alcohol dependence, mania and obsessive-compulsive disorder. On the other hand psychiatric illnesses may predispose patients to vitamin B12 deficiencies by changes in appetite, diet, or metabolic requirement (9).

Vitamin B12 has a very important role in the formation of red blood cells and maintenance of a healthy nervous system. On a complete blood count, a low red blood cell count is often the first sign that points to vitamin B12 deficiency. Marked anisocytosis, poikilocytosis, macroovalocytes, basophilic stippling, and hyper segmented neutrophils on a peripheral blood smear are common although not exclusive to vitamin B12 deficiency (21).

Drugs given to psychiatric patients especially anti-depressant drugs causes anemia. Long term uses of antidepressant drugs like lithium, clozapine and valporic acid cause anemia(22). First antidepressant drugs were a casual finding and they affect to various neurotransmitters systems (23).

Folic acid and vitamin B12 deficiency can be the cause of depression. Leading to a decreased S-adenine-methionine participates in neurotransmitter synthesis. The synthesis of methionine from homocysteine requires a supply of methyl groups from methyl foliate, and vitamin B12 as a cofactor. Thus the functional deficiency of either vitamin can lead in raised concentrations of homocysteine. Hemocystine accumulation can affect central nerves system receptors. It is toxic to neurons and blood vessels and can induce DNA stand breakage, oxidative stress and apoptosis (24).

Anemia also could accompany several psychiatric diseases. This could cause certain complications or an increase in the severity of the preexisting condition in the patients. The relationship between anemia and psychiatric diseases is known for a long period of time (21). However, there are only a limited number of studies investigating Hgb values, an indicator of anemia, among chronic psychiatric patients.

Also, currently there is no published research was found which investigated prevalence of anemia in adult psychiatric patients in Ethiopian populations. Thus, this study aims to examine the frequency of anemia among chronic psychiatric patients based on their diagnoses and clinical and socio demographic data, which could affect this frequency.

1.3 Significance of the study

Anemia is more common in psychiatric patients and identification of factors associated with anemia is important to improve the quality of life of the patient and early management of anemia in psychiatric illness. So it is intended to identify anemia and associated factors among adult psychiatric patients in JMC.

This will be useful in early management of anemia complications and for timely initiation of specific therapy. And also further useful for reducing morbidity and mortalities resulting from anemia in psychiatric patients. In addition, the findings could bridge the knowledge gap on prevalence of anemia in chronic psychiatric patients and associated risk in Ethiopia. Besides, the findings will be used as a base line data for other researchers in further.

CHAPTER TWO:-LITERATURE REVIEW

2.1 Mental illness

Mental illness is a general term that refers to a group of illnesses and disorders affecting the brain (24). It is widely recognized as a major contributor (14%) to the global burden of disease. According to recent World Health Organization estimates, nearly 25% of individuals develop one or more mental or behavioral disorders at some stage in their life, in both developed and developing countries and one-third of all years lived with disability worldwide can be attributed to neuropsychiatric conditions (21). The combination of high prevalence, early onset, persistence, and impairment, mental disorders make a major contribution to total disease burden (25).and the risk is higher among the poor, homeless, unemployed, persons with low educational level, victims of violence, refugees, indigenous populations, children and adolescents, abused women and the neglected elderly (26)

Mental illness is considered a silent epidemic throughout Africa due to substantial financial and systemic challenges. The infrastructure, psychosocial and socioeconomic contributors to the global mental health disparities in Africa, which include: low priority or lack of clear mental health policy; poor health infrastructure and lack of funding; insufficient number of trained specialists; poor legal protection and lack of equity; lack of evidence-based and culturally aligned assessment and treatment; stigma, discrimination and human rights abuses; and social, environmental and economic vulnerability (27).

In Ethiopia, mental illness is the leading non-communicable disorder in terms of burden. Indeed, in a predominantly rural area of Ethiopia, mental illness comprised 11% of the total burden of disease, with schizophrenia and depression included in the top ten most burdensome conditions out-ranking HIV/AIDS. These startling statistics show that mental illnesses have been overlooked as a major health priority in Ethiopia and other Lower middle income country’s (LMICs), and underscore the need for public health programs targeting mental illnesses. The average prevalence of mental disorders in Ethiopia is 18% for adults and 15% for children (27-29).

In low income countries where malnutrition and preventable infectious diseases are common, mental disorders which are regarded as non-life threatening problems are not given due attention. However, it is a well-known fact mental illness leads to poverty, malnutrition, infection and disability; consequently to the increased risk for mortality(30) .

WHO estimates the number of anemic people worldwide to be around two billion and nearly 50% of all anemia's can be attributed to iron deficiency. The negative consequences of iron deficiency anemia on cognitive and physical health and work productivity of adults have been well documented. Although anemia has been recognized as a major health problem for many years, a few study has been reported the relation between mental disorders and anemia (7).

2.2. Anemia in psychiatry

A prospective population-based study of older people conducted by the Italian National Research Council of Aging (INRCA, Florence, Italy) in 2005 identified anemia in 101 (10%) study participants of which 43 (10%) men and 58 (10%) women. Anemia was present in 48/313 (15%) participants with depression and in 53/673 (8%) participants without depression ($p<0.001$).Depression Scale (CES-D). Participants with a CES-D score 16 were considered to be depressed (31).

A case control study was conducted nationwide population based study on association between psychiatric disorders and iron deficiency anemia among children and adolescents by Mu.Hong Chen etal.in Taiwan from 1996-2008. The result shows a total of 2957 patients with IDA, with an increased risk of unipolar depressive disorder , bipolar disorder , anxiety disorder , autism spectrum disorder, attention deficit hyperactivity disorder , tic disorder , developmental delay, and mental retardation, were identified. Finally they concluded that children and adolescents with ADHD exhibited the higher risk of having a psychotic disorder (32).

A study done on psychical illness in admissible psychiatric patients in a tertiary care psychiatry institute of India from July 2007-December 2007, data of 1026 consecutive admissible severe psychiatric patients in two month follow up. Then 96 admissible patients (9.35%) before admission and 12 admitted patients (1.17%) during their hospital stay are transfer to medical surgical unit. The reason for transferring before admitting indicates that lower respiratory tract infection (2.83%), anemia (2.24%) (33).

A cross-sectional study was done on iron profile estimation in children (5-14 years) of behavioral disorder in child guidance clinic of University College of medical sciences and guru Tegh bahadur hospital in delhi puplished in 2010.Hemoglobin, Mean Corpuscular Volume, Mean Corpuscular Hemoglobin, Serum Iron, Total Iron Binding Capacity, Peripheral smear, Percentage transferrin saturation, serum ferritin estimations were done. The result shows that iron deficiency anemia was present in 75% of the children with behavioral symptoms. Serum ferritin was abnormal (<20 microgram/litter) in 67.8%of the children .there was statically significance association between pica and iron deficiency anemia ($p<0.001$)(34).

Another cross-sectional study was conducted in 2010-2011 at clinics of Tabriz University of Medical Sciences, Iran which enrolled 100 women diagnosed with major depression disorder(MDD), according to psychiatric diagnosis and Hamilton depression rating scale (HDRS). Convenience sampling was used to select these patients. In this study, Hgb< 12 g/dl considered as anemia. If the Hgb is < 12 g/dl, Fe and total iron binding capacity (TIBC) were also tested. TIBC levels > 360 μg/dl and Fe < 30 μg/dl were considered as IDA. This study concluded that 19% of women with depression were anemic and about 8% were suffering from IDA(7).

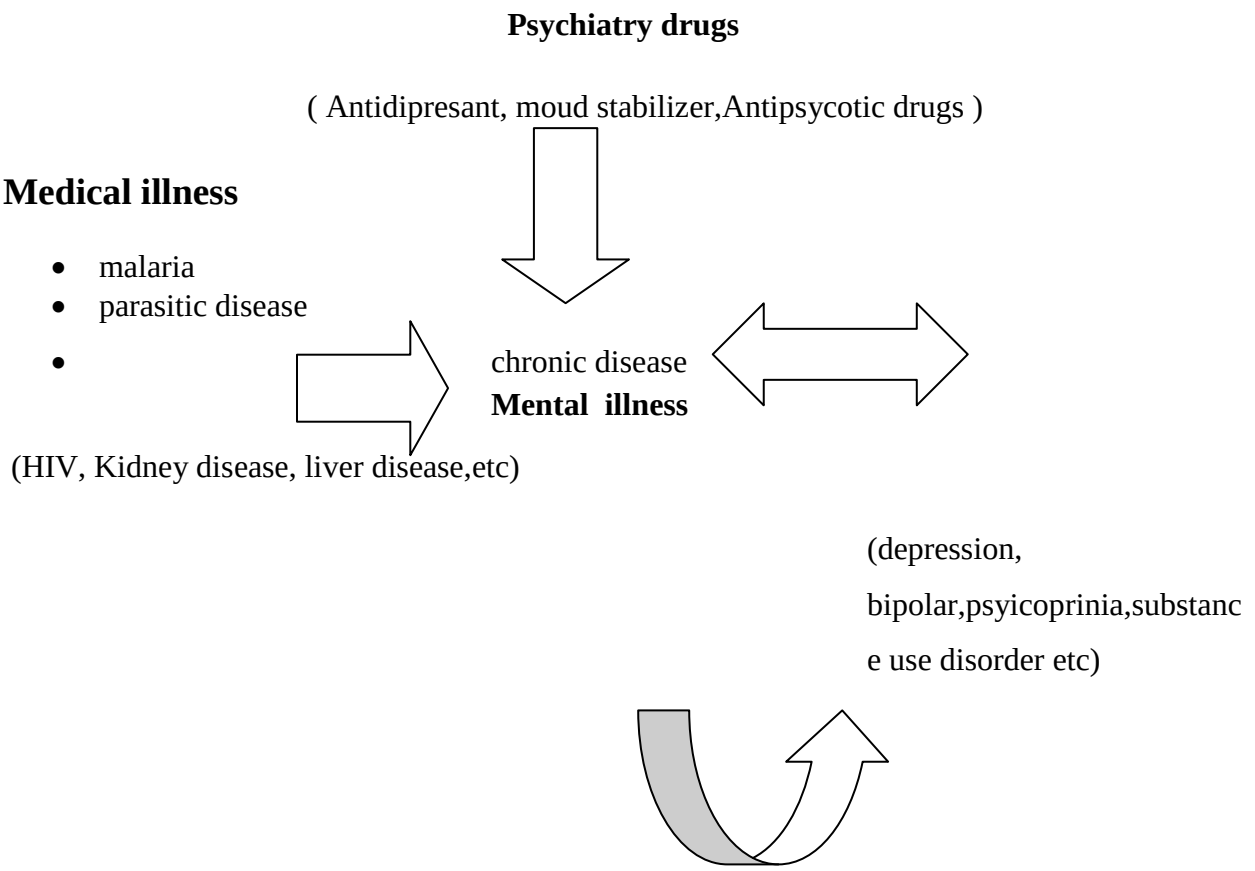
Other case control study was conducted on association between autism spectrum disorder and iron deficiency in children diagnosed autism spectrum disorder in the west bank.90 children with an age range 3-13 years participated. Serum ferritin, hemoglobin, hematocrit, mean corpuscular volume and red cell distribution width values were measured and analyzed. IDA was detected in 20% of autistic children with serum ferritin level (sf<10u/l).The result of this study indicated that there is an association between autism spectrum and iron deficiency anemia (35).

A cross-sectional study was conducted between Augusts 2011and February 2012, covering four government primary psychiatric health care centers in north West-Bank of Palestine. Two hundred and fifty four patients diagnosed with schizophrenia based on DSM-4 were selected by convenience sampling method. The components of CBC were evaluated using blood samples donated by schizophrenic patients. Data have shown that 55.9% of female patients and 13.7 % male patients suffered from anemia (36).

A cross sectional study was conducted on frequency of anemia in chronic psychiatry patients from April 2014 to April 2015 in Fırat University, Turkey.378 patients were included in the study for which hemoglobin and hematocrit values were recorded during their admission to the hospital. It determined that the overall prevalence of anemia was 25.4%. Thirty-five percent of females and 10% of males were considered as anemic. The frequency of anemia was the highest among psychotic disorder patients (35%), followed by generalized anxiety disorder patients (32%), and obsessive-compulsive disorder patients (26%). Anemia was diagnosed in 22% of depressive disorder patients, 25% of bipolar disorder patients, and 24% of conversion disorder patients (37).

A cross-sectional study done in Dodoma, Tanzania on correlates of intestinal parasites among patients admitted to Mirembe National Mental health hospital in 2017. 363 study participants were included in the study and the overall prevalence of intestinal parasite were 12.45%.the most common intestinal parasite found were *Schistosoma Mansoni* and *Hookwarm* which constituted 41.38% and 37.93% respectively(38) .

2.3 Conceptual frame work



CHAPTER THREE:-OBJECTIVES

3.1 General Objective

To determine the prevalence of anemia and associated factors among adult psychiatric patients in Jimma Medical Center, Southwest Ethiopia 2018.

3.2 Specific Objectives

To determine the overall prevalence of anemia among adult psychiatric patients who attends in psychiatric clinic of JMC, Jimma, Southwest Ethiopia.

To identify the types of anemia among adult psychiatric patients in JMC, Southwest Ethiopia

To identify the factors associated with anemia among adult psychiatric patients in JMC, Jimma Southwest Ethiopia

CHAPTER FOUR:-METHODS AND MATERIALS

4.1 Study area

The study will be conducted in JMC, Jimma Town Southwest Ethiopia. Jimma town is located 352 km southwest of Addis-Ababa, the capital city of Ethiopia at an altitude of 1780 meters above sea level. Based on the 2007 census conducted by the central statistical agency of Ethiopia, Jimma zone has a total population of 120,960 with an area of 50.52 square kilometers (39).Jimma Medical Center is the only teaching and referral hospital in the southwestern part of the country with bed capacity of 450 .It provides services for approximately 9,000 inpatient and 80,000 outpatient attendances a year coming to hospital from the catchment population of about 15,000.000 people (40).

The hospital has an outpatient psychiatry clinic as well as inpatient ward which was established in 1988.Now the inpatient ward has 47 beds. For the inpatient services currently the clinic is giving service for population of Jimma Zones of Oromia Regional State as well as Southern Nations, Nationalities and Peoples' Region (SNNPR).The clinic was run by 52 staff members and there are four doctors who specialized in psychiatry. Three with masters in psychiatry, seven bachelors in psychiatry, two diploma nurses in psychiatry, sixteen clinical nurses, three psychologist, one occupational therapist, nine porters and seven cleaners. Psychiatric center diagnosis new cases and monitors those on therapy (41).

4.2 Study design and period

Facility based cross-sectional study was conducted among adult psychiatric patient from April 10 to June 10, 2018, at psychiatric clinic of Jimma Medical Center.

4.3 Population

4.3.1 Source population

All psychiatric patients, who were admitted and on continuous follow up at Jimma medical center psychiatry clinic.

4.3.2 Study population

All adult psychiatric patients admitted and on continuous follow up in Jimma medical center psychiatric clinic during the study period.

4.4 Sample size and sampling technique.

4.4.1 Sample size

The sample size was calculated by using a general statistical formula for single population proportion.

$$n = \frac{(z\alpha/2)^2 \times p(1-p)}{d2}$$

$$n = \frac{(1.96)^2 \times 0.50(1-0.50)}{(0.05)^2}$$

n=0.96/0.0025

n=384

Where:

n = samples size

Zα/2=value of standard normal deviate at level of significance, 1.96 at 95% CI, α=0.05

d = the absolute precision and it was taken as 0.05.

P= the prevalence of anemia 0.5

There is a need of sample size correction

n= (no/1+n/N)

n=360

By adding 10% non-response rate the final sample size will be **396**

4.4.2. Sampling technique

Convenience sampling technique was used.

4.5 Variables

4.5.1 Dependent variables

 Anemia

4.5.2 Independent variables

 Age

 Sex

 Height

 Weight

 Income

 Marital Status

 Educational Status

 Employment (Jobs)

 Psychiatric Drugs

 Prolonged Menstruation

 Having Intestinal Parasites

 eating green Vegetables

 Eating Meat

Drinkingtea

Chronic (diseases Having HIV/ADIS, tuberculosis, kidney disease,liver disease)

4.6 Inclusion and Exclusion criteria

4.6.1 Inclusion criteria's

Age ≥18 years (Adult psychiatry patients)

4.6.2 Exclusion Criteria's

Pregnant mothers

Lactating mothers and those on

Vitamin/iron supplement during the last 6 months were excluded from this study.

4.7 Data collection

4.7.1 Socio demographic and related clinical data collection

Data were collected by using structured questionnaire. The questionnaire was filled by a trained sample collector. It was first prepared in English version and it was translated to Amharic and then translated to Afaan Oromo language. It answers questions socio-demographic characteristics, clinical data, nutritional habits were collected based a structured questionnaire based interview and filled by trained Bsc nurses.

4.7.2 Laboratory data

After collection of relevant clinical and socio demographic data, blood specimen was collected from each study participants for CBC, and identification hemoparasites and also stool specimen was collected for identification of intestinal parasite. The laboratory analysis was performed by professional laboratory technologist.

4.7.3 Sample collection and processing

Four (4) milliliter of venous blood samples was collected with Ethylene Diamine tetra acetic acid (EDTA) anti coagulated tube at psychiatric clinic of JMC and transported to JMC laboratory. Then the blood sample was used for complete blood count (CBC) and BF (blood film) for identification of hemoparasites such as malaria. The specimen was analyzed using HUMACOUNT® 30TS (Wiesbaden Germany) for complete blood count. In addition stool specimen was collected from each psychiatric patient to detect intestinal parasites.

Drops of blood from EDTA test tube was dispensed immediately on clean and frosted slides to prepare thin and thick blood smears per patient for microscopic detection and identification of malaria parasites. The slides were stained by 10% Giemsa for 10 minutes. The thick films examined for the detection of hemoparasites and the thin film were used to identify Plasmodium species. .

4.8 Quality assurance(QA)

4.8.1 Data collection tools

The questionnaire for the study was compiled and adapted after reviewing the literature and consulting experts, and pretested in 5 % of the establishments that was included in the actual study and processed during analysis. The questionnaire was translated to local language (Afaan Oromo), and data collectors were trained for one day by principal investigators (researcher).Regular supervision, spot checking and reviewing the completed questionnaire were carried out by senior nurse and by the principal investigator (researcher) daily.

4.8.2 Quality assurance (QA) and Quality control (QC)

In order to obtain reliable and valid data the following quality assurance measures were taken. Standard operating procedure (SOP) was followed for each laboratory procedures. Sample results were checked for flags, codes, messages, normal values, and consistency with the patient's condition. Routine instrument checks and quality control by known tri level samples (low, normal, high) was done according to the instrument manual. To avoid inter observer variability two medical laboratory technologists were look at the blood films. Each anthropometry measurements were taken twice and their mean was reported.

4.9 Data processing and analysis

Data from questionnaires and results from laboratory investigation were checked and entered in to SPSS version 20 software. Result was summarized by descriptive statics by using frequency, and percentage with cross tabulation. The association between the independent variable and dependent variables was assessed by binary logistic regression model. To control the effect of confounding variables multivariate logistic regression analysis was used. P-value < 0.05 was considered as statistically significant at 95 % confidence interval (CI).

4.10 Ethical Clearance

Ethical clearance was obtained from Jimma University Institute of Health ethical review board (IRB) and a letter of permission was obtained from JMC clinical director office. Oral informed consent was obtained directly from the study participants and ascent from the guardians after providing information about the purpose and the methods of the study. All abnormal results identified during the study period were reported to the health professionals working in JMC psychiatric clinic for intervention.

4.11 Dissemination of the result

The findings of this study will be presented primarily on Master's thesis defense, and the results will be also disseminated to the public through presentation in conferences. Furthermore a copy of the study will be given to health science library and the school of medical laboratory sciences and pathology. Finally efforts will be made to publish the finding in local and international journals.

CHAPTER FIVE:-RESULT

5.1 Socio demographic characteristics of the study participants

A total of 396 adult psychiatric patients who had regular follow up at JMC psychiatry clinic from April 10, 2018 to Jun 10, 2018 were participated in the study. Majority of the study participants were males 67.9% (n=269).The age range of the study participant (18-48)years and mean age were 30.57 years with a SD of 7.03. 15.4% (n=61) the participant were diagnosed with depression, 37.6% (n=149) the participant were diagnosed with bipolar disorder, 42.4% (n=168) the participant were diagnosed with Schizophrenia, and 4.5% (n=18) the were diagnosed with other psychiatric conditions.

(TABLE 1)

Table 1-Socio demographic characteristics of adult psychiatric patients in JMC, Jimma Southwest Ethiopia ,April 10 - Jun 10, 2018

Variables		Number(N)	Percent(%)
Gender	Male	269	67.9
	Female	127	32.1
Age	≤18	8	2.02
	19-25	115	29.04
	26-33	130	32.83
	34-41	125	31.56
	42+	18	4.55

Residence	Urban	126	31.8
	Rural	270	68.2
BMI	<18.5	64	16.2
	18.5-24.9	33	8.4
	25-29.9	294	74.2
	30+	5	1.2
Occupational Status	Privet	132	33.3
	Government	21	5.3
	Unemployed	243	61.4
Educational status	Illiterate	163	41.2
	Primary	197	42.7
	Secondary	32	8.1
	Colle**ge**/University	4	1
Typesof mental problems	Schizophrenia	165	41.7
	Bipolar	152	38.4
	Depression	61	15.4
	Other	18	4.5

5.2 Clinical characteristics of the study participants

The nutritional habit of adult psychiatric patients found in the study periods indicates, 60.4% (n=239) were regularly eating green vegetables. 82.6% (n=327) psychiatric patient didn't eat meat at list once in a weak and 17.4 %(n=69) of the study participants eat meat at list once in a weak .furthermore 38.1%(n=151) of psychiatric patient drunk tea regularly during breakfast and the rest 61.9 %(n=245) didn't drink tea all.

According to our study, there was no hemoparasites (malaria) seen .In addition stool examination for intestinal parasites were performed and the overall prevalence of intestinal parasites was *13.6% (n=54). From these 40.74% (n=22) had A.lumbricoides, 37.04%(n=20) had Hookworm* and 5.56% (n=3) patients had both *A. lumbricoides and T .tricuria* and the rest 16.67%(n=9) had other intestinal parasites. Furthermore *4(1%) of the study participants had chronic illness and among from these one study participant was known HIV positive*.

Most psychiatric patients use anti-psychotic drug 51.3%(n=203), antidepressant drug used patients were 17.4%(n=69) and mood stabilizer used patients 7.8%(n=31) ,MD+antisychotic15.9%(n=63),sedative 1.8%(n=7) and psychotropic drug use patients are 5.8(n=23). Psychiatric patients who uses psychiatric patients who had social support were 89.9%(n=356)and the rest 10.1%(n=40) psychiatric patients have not social support. (TABLE 2)

TABLE 2-Nutritional habits and clinical findings of adult psychiatric patients in JMC, 2018

Characteristics		Frequency	Percentage (%)
Green Vegetables Consumption	Yes	239	60.4
	No	157	39.6
Eat Meat Consumption	yes	55	13.9
	No	341	86.1

Tea Drinking	Yes	151	38.1
	No	245	61.9
Intestinal Parasites	Yes	54	13.6
	No	342	86.4
History Of Chronic Illness	Yes	4	1
	No	392	99
Psychiatric Drug	Antidepressant	69	17.4
	mood stabilizer	31	7.8
	anti-psychotic	203	51.3
	Sedative	7	1.8
	AD+AP	63	15.9
	Other combination	23	5.8
Other Drug (Psychotropic)	yes	6	1.5
	no	390	98.5

5.3 Prevalence of Anemia

The overall prevalence of anemia among adult psychiatric patients in JMC psychiatric clinic was 11.9% (n=47).From the anemic study participants 97.9% had mild anemia and the remaining 2.1 % had moderate type of anemia. 13.7% of the anemic patients were found in the age range (34-41years). slightly high amount of the anemic patients 12.3%(n=36) had normal BMI value 18.5-24.9.and also the prevalence of anemia among adult psychiatric patients is high among illiterate and un employed patients that accounts 14.2%(n=23)and 13.2%(n=32) respectively .

Slightly high amount of the anemic study participant in this study diagnosed in other psychiatric disorders 16.7%(n=3),second predominate type of disorder associated with anemia is Bipolar disorder patients 13.8% (n=21) and the third predominant type of disorder were schizophrenia 10.9%(n=18) and also almost half of the anemic individual 55.3%(n=26) use anti-psychotic drugs.(TABLE 3)

TABLE 3- Prevalence of anemia among socio demographic characteristics of adult psychiatric patients in JMC. 2018.

VARIABLES		ANEMIA	
		Yes N (%)	No N (%)
SEX	Male	32(11.9%)	237(88.1%)
	Female	15(13.5%)	112(86.5 %)
AGE	≤18	1 (12.5%)	7 (87.5%)
	19-25	14 (10 %)	106 (28.9)
	26-33	13 (10%)	117 (90%)
	34-41	17 (13.7%)	108 (86.3%)
	42+	2 (10.5%)	16 (89.5%)
BMI	<18.5	7 (10.9%)	57(90.1%)
	18.5-24.9	36 (12.3%)	258(87.7%)
	25-29.9	3 (9.1%)	30(90.8%)
	30+	1 (20%)	4(80%)
RESIDENCE	Urban	14(11.1%)	112(98.9%)
	Rural	33(12.2%)	237(87.8%)

MARITAL STATUS	Single	22(12.8%)	151(87.2%)
	Married	17(9.1%)	170(90.9%)
	divorce	7(21.2%)	26(78.8%)
	widowed	1 (33.3%)	2(66.7%)
EDUCATIONAL STATUS	illiterate	23(48.9)	139(39.9)
	primary	18(38.27)	178(51.1)
	Secondary	5(10.6)	27(7.8)
	college/university	1 (2.12)	4(1)
Occupational Status	privet	14(29.8)	116(33.3)
	Government	1(2.1)	20(5.7)
	un employee	32(68.1)	211(60.6)
TYPES MENTAL PROBLEM	depression	5 (10.6)	56 (16)
	Bipolar	21 (44.7)	131(37.5)
	schizophrenia	18 (38.3)	147 (42.1)
	other	03 (6.4)	15 (4.5)

5.4 Mean and Standard Deviation of RBC parameters

Out of 396 psychiatric patients, majority of the patients were males 269 (67.93%).For male patients, the mean value RBCs count, hemoglobin concentration, hematocrit, mean corpuscular volume, mean cell hemoglobin, mean cell hemoglobin concentration and red blood cell distribution width were 5.74±0.59g/mm^3,15.46±1.85g/dl,48.38±4.82%,84.36±7.26fl,27.24±2.46/l,32.17±4.34g/dl,14.69± 7.58% respectively. While among female patients, the mean volume of RBCs ,hemoglobin, hematocrit , mean corpuscular volume, mean cell hemoglobin, mean cell hemoglobin concentration and red blood cell distribution width were 5.46±0.63 g/mm^3,14.48±1.96 g/dl, 45.27±5.08%,83.24±6.12fl, 26.80±2.74 /l, 32.09±2.40 g/dl ,13.82±4.55% .There was a significance difference of mean value of (RBCs ,HGB, HCT) among male and female study participants (p value<0.001). On the other parameters i.e MCV (P value=0.135) ,MCH(P value=0.115),MCHC(P value=0.841) and RDW(P value=0.232) were not have spastically difference among male and females.(TABLE 4)

TABLE 4-**Mean And SD Of RBc Parameters Of Adult Psychiatric Patients In JMC, JImma, Southwest Etiopia,2018**

Variable	Male (N=269)	Female (N=127)	Total (N=396)	P VALUE	95%CI
RBC	5.74±0.59	5.46±0.63	5.65±0.62	P<0.001	4.34(0.154-0.411)
HGB	15.46±1.85	14.48±1.96	15.15±1.94	P<0.001	4.84(0.583-1.382)
HCT	48.38±4.82	45.27±5.08	47.38±5.10	P<0.001	5.88(2.07-4.14)
MCV	84.36±7.26	83.24±6.12	84.00±6.92	P=0.135	1.49(-3478-2.579)
MCH	27.24±2.46	26.80+2.74	27.10±2.56	P=0.115	1.56(-1.106-0.976)

MCHC	32.17±4.34	32.09±2.40	32.15±3.82	P =0.841	0.201(-7276-0.89)
RDW	14.69±7.58	13.82±4.55	14.41±6.76	0.232	1.198(-5591-2.304)

5.5 Associated factors of anemia among adult psychiatric patients

The bi variate logistic regression analysis showed significance association between anemia and eating meat habit at list once in a week(P value=0.125),eating green vegetables regularly (p value=0.004),psychotropic drug use (p value =0.021),Intestinal parasites (p value<0.001).All variables mentioned above with p<0.25 were considered candidate for incorporating all in the multivariate logistic regression to identify the independently associated variables with anemia.

(TABLE-5)

TABLE 5 –Bivariate logistic analysis of anemia among adult psychiatric patients in JMC.

VARIABLES		**ANEMIA**		**P VALUE**	**COR (95%CI)**
		YES	NO		
AGE	≤18	1 (12.5%)	7 (87.5%)	0.981	1.008(0.525-1.937)
	19-25	14 (11.6%)	107 (88.4%)		
	26-33	13 (10%)	117 (90 %)		
	34-41	17 (13.7%)	107 (86.3%)		
	42+	2 (10.5%)	17 (89.5%)		
SEX	Male	32(11.9%)	237(89.1 %)	0.950	1.001(0.950-1.046)
	Female	15(13.5%)	111(86.5 %)		
BMI	<18.5	7 (10.9%)	57(89.1%)	0.883	
	18.5-24.9	36 (12.3%)	257(87.7%)		
	25-29.9	3 (9.1%)	30(90.9%)		

	30+	1 (20 %)	4(80%)		
RESIDENCE	Urban	14(11.1%)	112(88.9 %)	0.750	0.898(0.462-1.744)
	Rural	33(14.0%)	236(86 %)		
EDUCATIONAL STATUS	illiterate	23(14.2%)	139(39.9 %)		
	primary	18(9.2%)	178(51.1%)	0.703	1.094(0.689-1.735)
	Secondary	5(15.6%)	27(7.8%)		
	college/university	1 (20 %)	4(1%)		
MARITAL STATUS	Single	22(12.7%)	151(87.3 %)		
	Married	17(9.09%)	169(99.9%)	0.498	0.855(0.545-1.341)
	divorce	7(21.2%)	26(78.8%)		
	widowed	1 (33.3%)	2(66.7%)		
JOBS	privet	14(10.8%)	116(33.3%)		
	Government	1(4.8%)	20(5.7%)	0.416	0.871(0.621-1.221)
	un employee	32(13.2%)	211(60.6%)		
EATING GREEN VEGETABLES	YES	19 (7.95%)	220(92.05%)	**0.004**	2.513(1.35-4.680)
	NO	28(17.83%)	129(82.16%)		
EATING MEAT	YES	03(5.45%)	52(94.54%)	**0.125**	0.389(0.117-1.301)
	NO	44(12.9%)	297(87.09%)		
DRINKING TEA	YES	22(14.57%)	129(85.43%)	0.194	1.501(0.81-2.77)
	NO	25(10.20%)	220(89.8%)		

PSYCHIATRIC DRUG USE	Antidepressant	6(8.69%)	63(91.31%)	0.662	1.050(0.842-1.309)
	Mood stabilizer	5(16.13%)	26(83.87%)		
	Antipsychotic	26(12.87%)	176(87.13%)		
	Sedative	3(37.5%)	5(62.5%)		
	MS+AS	8(12.5%)	56(87.5%)		
	Others	0	23(100%)		
PSYCHOTROPIC DRUG USE	YES	3(50%)	3(50%)	**0.021**	
	NO	214(54.87%)	176(45.13%)		
PARASITIC DISEASE	YES	19(25.9%)	35(74.07%)	0.001	6.088(3.087-12.007)
	NO	28(8.19%)	314(91.81.%)		
CHRONIC DISEASE	YES	0	4(1.1%)	**1.000**	1.000(1.74-5.75)
	NO	0(47%)	343(98.6%)		

5.6 Multivariate Logistic Regression Analysis Of Anemia Among Adult Psychiatric Patients In Jmc, Southwest Ethiopia 2018.

Multivariate logistic regression analysis showed that not eating green vegetables regularly have risk of anemia (AOR=2.195, 95%ci 1.113-3.331)(p=0.023) and also having intestinal parasites have greater risk of anemia (AOR=6.535,95%ci 3.193-13.373)(p<0.001) remind independent risk factors for anemia in adult psychiatric patients.(table 6).

TABLE 6-**Multivariate Logistic Regression Analysis In Relation To Anemia Among Adult Psychiatric Patients At Jimma Medical Center, South West Ethiopia 2018.(N=396)**

COR-Crud Odd Retio,1* -reference value

variables		Frequency	Percentage	COR(95%CI)	P VALUE
GREEN VEGITABLES	Yes	19	40.43	1*	0.023
	No	28	59.57	2.195(1.113-4.331)	
Eat meat	Yes	03	6.38	1*	0.107
	No	44	93.62	0.341(0.092-1.263)	
Drinking tea	Yes	22	46.80	1*	0.205
	No	25	53.20	1.543(0.790-3.041)	
Intestinal parasites	Yes	19	40.42	6.535(3.193-13.373)	<0.001

	No	28	59.57	1*	
Psychotropic drug used	yes	03	6.4	7.86(1.540-40.166	0.013
	no	214	93.6	1*	

CHAPTER SIX:-DISCUSSION

The prevalence of anemia in psychiatric patients had shown different results in various studies. From this study the overall prevalence of anemia were 11.9% .This study is lower than the study reported in Turkey on the frequency of anemia in psychiatric patients which is 25.4% (37).More over the prevalence reported in this study higher than the report in Tercalary care psychiatric clinic of India which was found that 2.24%(33). The reasons for the difference in the prevalence rate could be due to the characteristics of population, different life style, duration of antipsychotic drug used, geographical variations.

In the study done in northwest bank Palestine on the prevalence of anemia among 254 schizophrenia patients they found the prevalence of 55.9 % female patents and 13.7% male patients suffer from anemia. Which is higher than reported in this study on female patients 31.9% (n=15). From the male study participant 68.1% (n=35) have anemia in this study. The difference may be small sample size used in Palestine, different life styles and types of psychotropic drugs used (36) .

In the study done in Florence, Italy on the prevalence of anemia among 101 study participants depressive patients according to CES D 16 criteria which was 15%.which is higher than the study reported in our thesis the anemia prevalence in depressed participants 10.6%(5/47).And my study is also lower than the study done in Turkey which was 22%(31,37).The difference may be small sample size used in Chiantis, different geographical area.

Also intervening organic conditions could have increased the prevalence of anemia types, such as chronic disease anemia. It is known that among women of reproductive age who experience blood loss due to menstrual bleeding, anemia is more frequent. In this study, 31.9 % of females and 68.1% of males were determined as anemic. Although it varies based on the age group and domicile, anemia prevalence is generally reported as 35% among females and 10% among males in the literature(37). Although the anemia prevalence among female in the study was parallel to the findings in the literature, the anemia rates among male were higher than the rates reported in the literature.

The study findings demonstrated that anemia frequency was the highest (44.7%) among the bipolar patients according to diagnostic groups. The second predominant type were schizophrenia (38.3%) and depression accounts (10.6 %). In the literature, one study reported that 19% women with depression are anemic and other study says anemia is found 35% psychotic patients ,22% in depressive patients and 25% in bipolar patients.(7,37) The findings of this study reflected quite higher figures when compared to the findings reported in other studies in the literature. Psychotic disorder patients face negative living conditions where they could not express themselves and could not even sustain their basic needs of nourishment and accommodation. As a result of these factors and also since health professionals tend to prioritize their mental condition and ignore their physical complaints, the physical symptoms are usually passed over, and their preexisting psychiatric disorder aggravates.

The prevalence of anemia in the depressive disorder patient group (8.2%) was found to be parallel to the general population of this study, lower than the findings in the study done in turkey on the frequency of anemia in chronic psychiatric patients 22%(37). It was determined in the study that 38.3% of bipolar patients suffered from anemia as well. Psychotropic drugs used for chronic psychiatric diseases cause significant hematological side effects, such as anemia, leukopenia, thrombocytopenia, and thrombocytosis. These side effects are observed more frequently in patients who use mood stabilizer drugs, such as lithium, clozapine, carbamazepine, valproic acid, and reuptake inhibitors.(22) The reason for high anemia rates among bipolar patients in the study could be related to the long-term use of these mood stabilizer drugs.

In addition the overall prevalence of intestinal parasite among psychiatric patients done in Tanzania Dodoma was 12.45%(38).which is slightly lower than the prevalence of intestinal parasite in this study 13.6%.This slight variation could be sample size difference between the two population.

In chronic psychiatric patients, the rate of existence of an accompanying physical disease in addition to the primary disorder is usually high. This coexistence deteriorates the quality of life of the patients, prolongs the psychiatric treatment period, and could even cause an increase in morbidity and mortality. Factors such as negligence of physical symptoms by mental health professionals, assessment of physical complaints as psychosomatic, reluctance of non-psychiatrist physicians to provide services to psychiatric patients, lack of time and resources for

checkups in mental health services, and inefficiency of patients in explaining their medical problems and difficulties related to implementing changes in lifestyle, could prevent psychiatric patients from receiving appropriate health care services. Treatment related factors, physical conditions, the presence of intestinal parasites, and nutritional disorders are the reasons for anemia among chronic psychiatric patients. Detailed identification of the physical symptoms of psychiatric patients and providing health care services to them, who experience problems in expressing their complaints and are often labeled by the society, are quite important for early diagnosis and treatment.

Limitation of the Study

- Since the study design was cross sectional which referenced about a single point in time.

CHAPTER SEVEN:-CONCLUSION AND RECOMMENDATION

7.1 CONCLUSIONS

This study identifies anemia and associated risk factors among adults psychiatric patients in JMC. The prevalence of anemia was high among illiterate, un employed patients, residence rural .this study shows measuring of hemoglobin during each follow up have important role in early management of anemia and in order to reduce the consequence of anemia among psychiatric patients.

7.2 RECOMMENDATIONS

Identification of peoples who have anemia at earlier stage may reduce the impact of anemia in psychiatric patients.

CBC (complete blood count) should be done before initiating antipsychotic drugs and during in each follow up in order to evaluate antipsychotic drugs had impact on the concentration of hemoglobin.

Stool examination for intestinal parasites should be done during each follow up of psychiatric patients.

Health care provider should be inform and educate the association between anemia and psychiatry illness.

Health education worker should inform and educate psychiatric patients how to change their life style.

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ANNEXES

Annexe1Questioner in English

A questionnaire prepared to assess prevalence of anemia and associated factors among psychiatry patients in JimmaMedical Center psychiatric clinic.

Date…… Study number…….

Part one :socio demographic characteristics

Introduction: for the following question please circle one from the given chooses/write in words

1-Sex 1-male 2-femel

2-Age……..years

3-Height in meter ----------

4-Body weight in kg ----------

5-Residence 1-urban 2-rural

6-Educational status 1-illitrate 2-primery 2-secondery

3-College/university

7-Marital status 1-single 2-marid 3-divorse 4-other

8-Employment states 1-privat e 2-government 3-non employee

9-Monthly income ----------in birr

Part two: Nutritional habits

10-have you eat green vegetables regularly? 1-Yes 2-No

11- do you eat meat at list once in a week? 1-yes 2-no

12-do you drink tea regularly every breakfast /any time in a day? 1-Yes 2-No

Part there: mental health

13-which types of mental problem do you have? 1-Depresstion 2-Anexaity

3-Bipolar 4-Schizopherenia 5-other

14-what is the type of drugs used for Diagnosis? 1-Antidepresant 2-mood Stabilizer 3-Antipsycotic 4- Sedative

15-Do you use other drugs? Please specify…….

16-Do you have social support? 1-Yes 2-No

Part four: Menstrual history for female

14-Have you seen menstruation every month? 1-Yes 2-No

15-If yes ,what is the duration of the period? ……(Days)

16-How many children(birth) do you have? ----------

Part five: clinical data

17-Malaria parasites (hemo parasites) 1-Yes 2-No

18-if yes, which type of malaria parasite? 1-facciparem 2- vivax 3-mixed

19-Intestinal parasite 1-yes 2-no

20-if yes ,which type of intestinal parasite?1-Ascaris 2-Hookwarm 3-shitosomiasis 4-other

21-Do you have other chronic illness? 1-yes 2-no

22-if yes ,whch type of chronic illness? 1-HIV 2-Liver disease 3-kidney Disease 4- BP 5 other

Part six: laboratory investigation for CBC

WBC total ……..x10^3

Lym …….%

Mix ……%

Neu ……%

RBC total …….x10^6

HGB …….g/dl

HCT ……%

MCV …….fl

MCH …….pg

MCHC ……g/dl

RDW ……%

Platlet Count ……10^3

Annex 2 Questioner in Amharic version

መጠይቅ **1** **የቢተሰብና ማህበራዊ ገፅታ**

መመሪያ፡ለሚከተሉት ጥያቄዎች **ከ**አራጮቹ አንዱን

በማክበብ /በፅሁፍ/በመሙላት መመለስ፡

1-ፆታ **1** ወንድ **2** ሴት

2-እድሜ ---------- አመት

3-የሚኖሩትየትነዉ**1** ከተማ **2** ገጠር

4-የት/ትሁኔታ **1** ያልተማረ **2** አንደኛደረጃ **3** ሁለተኛደረጃ **4**ዩኒቨርስቲ

5-የጋብቻሁኔታ **1** ያላገባ **2** ያገባ **3** የተፋታ **4** ልላካለ

6-የስራሁኔታ **1** የግል **2** የመንግስት **3** ስራ አጥ

ክፍልሁለት የአመጋገብ ልምድ

7-አረንጎዴ እፅዋትን **(**አታክልቶችን**)** ትመገባለሀ**?**

1 አዎ **2** አልመገብም

8-በሳምንት ስንት ጊዜ ስጋ ትመገባለህ /ትመገቢያለሺግለፅ/ሽ **?** ----------

9-ሻይ በቁርስ ሰዓት ትጠጣለህ/ትጠጫለሽ? **1** አዎ **2** አልጠጣም

ክፍልሶስት የአዕምሮ ጤና በተመለከተ

10-የትኛው የአዕምሮ ህመም አይነት ተጠቂ ነህ? **1**ዲፕረስን **2** ሳይኮፍሪንያ **3** ባይፖላር **4** ሊላ

11-የምትጠቀመው አዕምሮ መድሀኒት አይነት የትኛው ነው **?** **1** አንቲዲፕረሳንት **2** ሙድእስተብላይዘር **2-**አንቲሳይኮቲክ **4** ስዳቲቭ

12-ሌላየምትወስደው የመድሀኒት አይነት አለ ?ግለፅ ----------

13-ከማህበረሰብ ድጋፍ ታገኛለህ /ያደርጉልሀል **?** **1-**አዎ **2** አይ

ክፍልአራት- የወር አበባ ኡደትን ይመለከታል

14-የወር አበባ በየወሩ ታያለሽ /ይመጣል?

1 አዎ **2** አይ

15-አዎካሉምንያህልጊዜይቆያሉ----------

ክፍል አምስት ክሊኒካል መረጃ

16-የወባበሽታአምጪተዋስያንበደምውስጥ

1 አለ **2** የለም

17-የሆድውስጥትላትልበሰገራውስጥ

1 አለ **2** የለም

18-ካለ የትላትሉ ስም----------

19-ኮየት ያሉ በሽታዎች በሰውነትህ ውስጥ ነበር (የእድስበሽታቫይረስ፣የኩላሊትበሽታ፣የጉበትበሽታ

ክፍል ስድስት የደም ምርመራ ውጤቶ

Wbc= x10^3 MCH= pg

lym= % MCHC = g/dl

Neo-= % RDW= %

mix= % Platelet count= x10^3 /u

Rbc total = x10^6 /ul

hgb = g/dl

Hct= %

mcv = fl አመሰግናለሁ

Annex 3 QUATIONER IN AFFAN OROMO VERSION

Gaaffii 1 :- HaalaMaatii fi Hawaasummaa

Qajeelfama: gaaffiiwan itti aananukeessaa tokkoirratti geengessuudhaan /barreeffamaan/ guutuudhaan deebisuu

1-Saala 1- Dhiira 2-Dubara

2-Umrii waggaa ----------

3-Hojjaan keemeeqa? ----------

4-Ulfaatinni keemeqa? ---------

5-Iddoon jireenyaaeessa? 1-magaalaa 2-baadiyyaa

6-Haala barnootaa 1- hinbaranne 2- sad.tokoffaa

3-sad.lammaffa 4- kolleejii/Yuunivarsitii

7-Haala gaahelaa 1-kan hinfuudhin 2-kan fuudhe 3- kanwalhiike4-kan biraayoojiraate

8-Haala hojii 1-kan dhuunfaa 2-kan mootummaa 3-hoji dhabaa

9-Galiin keemeeqa? ----------

Kutaa lama Muuxxannoonyaataa

10-Biqiloota magariisa (kuduraalee) yeroo hundani nyaattaa?

1-Eyyee 2-hin nyaadhu

11-Foon turban itti yoo xiqqaate yeroo tokkoni nyaattaa?

1-Eyyee 2-hin nyaadhu

12-Shaayee yeroo hundumaa cireeirratti nidhugdaa

1-Eyyee 2-hin dhugu

KutaaSadii Fayyaa Sammuu Ilaalchisee

13-Akaakuu dhukkubaaisa kamiin hubamteejirta? 1-Dippireeshiinii 2-Angizaayitii 3- Baaypoolaar 4-Fiiziyoofiriiniyaa 5-kan biroo

14-Akaakuun qorichaaa ti dhukkubasammuutii ffayyadamtuisa kami?

1-Anti-dipireesaantii 2-Muud Isteepilaayizerii 3-Anti-Saayikootiik 4-Seedaatiiv

15-Qoricha ergaeega lteha gamgeesseetta? ----------

16-Akaakuun qorichaa kan biraaa ti fudhattujiraa? ----------

17-Deeggarsa hawaasa irraani argattaa/ deeggarsasiifgodhuu?

1-Eyyee 2-lakki

Kutaa Afur – Sirna dhufaatii Laguuilaalchisee

18-Laguu /Xurii/ ji'aji'aanniargitaa/ ni dhufaa?

1-Eyyee 2-lakki

19-Eyyee yoo jettan yeroo ammamiiftura? ----------

20-Ijoollee meeqa qabda? _____

Kutaa Shan odeeffannoo Kiliinikaalii

21-Baattoowwan dhukkubabusaa fidandhiigakeessa

1 – jira 2- hinjiru

22-Jira yoojettan 1 – P-faasiipaarem 2-Vaayvaaksii 3-walmakaa

23-Raammoon garaakeessaa booliikeessa

1 – jira 2- hinjiru

26-Jira yoo jettanmaqaa Raammoo 1- Askariis 2-Huukworm

3-Shistoozoomaa 4-Askariisii fi Tiriikuriis 5-kan biroo

25-Dhukkuboonni turtii dheeraa qabanu qaama keessa turaniiruu**?**

1-jira 2-hinjiru

26-Dhukkuboonni turtii dheeraaqabanu qaama keessa turaniiruu? Jira yoo jettan

1-dhukkuba vaayirasiiEdsii 2-dhukkuba kale 3-dhukkuba Tiruu

4-dhukkuba dhiibbaa dhiigaa

KutaaJahaBu’aaqorannaadhiigaakeessan

Wbc= $x10^3$ **MCH= pg**

lym= % **MCHC = g/dl**

Neo-= % **RDW= %**

mix= % **Platelet count= $x10^3$ /u**

Rbc total = $x10^6$ /ul

hgb = g/dl

Hct= %

mcv = fl Galatoomaa

Annex 4 Procedure for venous blood collection

The blood samples will be obtained from the antecubital vein for analysis.First ,the subject will be told he /she is going to give the blood sample and will be asked for permission. Then sterile syringe of the capacity required will be selected and apply a soft tubing tourniquet to the upper arm of the subject then clean the puncture site with 70% ethanol and allow drying.don't touch the clean area

When sufficient blood (4ml)has been collected ,the tourniquet will be released and instruct the subject(patient)to open his or her first then remove the needle and immediately press on the puncture site with a piece of dry cotton wool and remove the tourniquet completely. Instruct the subject to continue pressing on the puncture site until the bleeding stopped.

The collected blood will be filed in to EDTA tube .quality of sample will be checked depending on the standard operating procedure in place and use for quantity required analisis.

Annex 5 SOPS (Standard Operating Procedures)

A.For stool Examination

- Lable a clean slide with patient's number and initials.
- Perform macrscopic examination of the stool.
- Prepare a stool smear on slide.
- Place a drop of normal saline on spot and emulsifying using applicator stick.
- Cover the smear with cover slip and ready for examination.
- Microscopic examination to identify and report parasites, if no a parasite seen will be negative.

B.How to collect thick blood smear for malaria

Thick film examination is about 20 times more sensitive than thin film examination for malaria detection.

C.Prepare thick film in the following way.

- Take a clean dust free, grease free slide and take 3 drops of the blood from sample of EDTA containing tube and1 cm from the edge of the glass slide.
- Make thick smear by joining the 3 drops of blood and spreading it in an area of 10 mm diameter.
- Allow it to air dry.

D.PrepareGimsa Stain From The Stoke

- Dilute Gimsa stock solution 1:10 using buffer ph 6.8.
- Fill the staing jar with prepared Gimsa solution.
- Insert the side in to the staing jar stain for 15 minutes. and the slide don't touch each other.
- Wash with clean water that's found in small container.
- Rinse with clean water agine in another small container.
- Put the stained smear on a staining rack and leave to air dry.

- Stained blood smear is now ready for microscopic examination.

E.SOPS(Standard operating procedures) for CBC

2.1 Complete blood cell counting by *HUMACOUNT® 30^{TS}*

Principle

HUMACOUNT 30^{TS} can process 30 samples per hour in 3 part differential mode. Uses electrical impedance method for determining WBC, RBC, and PLT data and determining hemoglobin is through formation of Methemoglobinchromogen using cyanide free lytic reagent, which is measured photometrically at 555nm.

- **Specimen**: EDTA anticoagulated whole blood
- **Reagents** :
  - Diluent: isotonic saline solution used to dilute specimen and rinse fluidic system
  - Lyse: used to prepare blood hemolysate for WBC and Hgb measurement
  - Cleaner : used to clean the fluidics
- **Daily startup check**: before running control and patient sample run background count until results are within the acceptable range; if not in the acceptable range perform cleaning.
  - Blank measurement range: HGB: 0-10 g/l

    WBC: 0-0.5 x 10^3cells/µl

    PLT: 0-25x10^3cells/µl

    RBC: 0-0.05x10^6 cells/ µl
- Quality control: on a daily basis before running patient sample perform quality control (QC) procedures.
- Procedure for daily QC control run :
  - Place a well mixed control sample tube on the sample rotor
  - Press start button on the analyzer

- If clog or other error messages appear on the screen clean the analyzer using cleaning procedure
- If the control result fall within the acceptable limit review the data for shifts and trend record the result and begin processing the sample

➢ Patient specimen running Procedure

- Invert the closed sample tube at least 8 times ,do not shake
- Position the sample tube in the sample rotor on the instrument
- Press start key
- Sample rotor will turn the vial into the inside and needle draws sample from the tube 25µl
- After the cycle is completed, run results are displayed on screen, press [print report] to obtain a copy of the results.

Normal ranges blood indices for age >18

	MALE	FEMALE
WBC	4.5-11.0 x10^3	4.5-11.0 x10^3
LYM	24-44%	24-44%
EOS	0-3%	0-3%
BAS	0-1%	0-1%
MON	3-6%	0-6%
NUT	35-66%	35-66%
RBC	4.5-5.9 x10^6	4.0-5.2 x10^6
HGB	13.5-17.5 g/dl	12.0-15.0 g/dl
HCT	37-53 %	33-51 %
PLT	150-450x10^3	150-450 x10^3
MCV	80-100	80-100

MCH:26-34	26-34
MCHC:32-36	32-36
RDW:11.5-13.1	11.5-13.

Annex 6 INFORMATION SHEET IN ENGLISH VERSION

Information Sheet

Title Of The Study- anemia prevalence and associated factor among adult psychiatric patient in Jimma Medical Center.

Principal Investigetre- Jemila Seid Mohammed, postgraduate student from Jimma Universty

Purpose of the study-to know the prevalence of anemia in psychiatric patient.Psychiatric patients are at high risk of anemia .

Introduction-I am Jemila Seid from college of medical laboratory science, I am going to carry out a study on the risk factor of anemia in psychiatric patient and its prevalence. This study will help us understand the factors that are likely to contribute to anemia in psychiatry patient so that they can be addressed in order to improve the quality of their life of these patient. I am therefore requesting you to participate in this study.

Procedure-During the study, the following will be done 1)you will be asked about past medical and nutritional history.2)you will be examined.3)we shall collect samples of blood stool from you. This will include blood and stool. During sample collection ,strict aseptic measures will be used to make sure that you does ‘nt expose to infection.

Benefit-you will receive a complete medical exam,theinvestigations done during the study will be free of charge .findings from these study will help us in setting prevention program and early detection and also developing treatment protocols. For those who were anemic will get proper treatment.

Risk and Discomforts-During the process of drawing blood you will feel some pain however this will be mild .we shall collect about teaspoon(4ml) of blood from you to do the blood tests.This amount of blood will be too smallto cause harm to your health. All information obtained in this study will be considered confidential.

Confidentiality-your health records will be kept confidential and only the people working on the study will have access to them. A study number will be used instead of your name.

Who to contact-these research has been reviewed and approved by the ethics committee. If you have any questions ,you may ask those now or latter. If you wish to ask questions later, contact me at:JemilaSeidTel:**0917004185**I have been invited to participate in this research.

Statement of consent-The purpose and nature of this study has been explained to me and I understand that I participate in this study voluntarily and that no consequence will result I refuse my self from participation. I have the right to know to know the results of the laboratory tests. By signing this form, I agree to participate in this study:

Parent/guardian signature …… Date ……..

Patient ID…….. Patient initials……

PI signature…… Date …….

Annex 7 INFORMATION SHEET IN AMHARIC VERSION

ለጥናቱ መረጃ መግለጫ ቅፅ

የጥናቱ አላማ

የዚህ ጥናት አላማ መሰረት ያደረገው የደም ማነስ ችግር ከአዕምሮ ህመም ጋር ያለውን ግንኙነት (ቁርኝት) በአዕምሮ ህሙማን ጎልማሶች ላይ ለማጥናት ነው።እርሶ በዚህ ጥናት መሳተፍዎ የደም ማነስ ችግር በአዕምሮ ህሙማን ላይ የሚያደርሰውን (የሚያስከትለውን) ህመም ለመቆጣጠር ይረዳናል።

በጥናቱ ስለ መሳተፍ

በዚህ ጥናት ላይ መሳተፍ በሙሉ ፈቃደኝነት ላይ የተመሰረተነው።ስለሆነም በመጀመሪያ በጥናቱ እንዲሰተፍፈቃደኝነተዎን በትህትና እንጠይቃለን።በዚህ ጥናት ለመሳተፍ ከፈቀዱ ለአምስት ደቂቃ ያህል ለጥያቄዎች ምላሽ ይሰጡናል።በተጨማሪም ለተለያዩ ምርመራዎች የደምናሙና ለመስጠት ፈቃደኛ እንደሆነ እንጠይቆታለን።

በጥናቱ በመሳተፍ የሚገኝ ጥቅም

የደም ናሙና በላብራቶሪ ስመረመር ጠቃሚ ውጤት ካለ ከዶክመንት ጋር እንዲያያዝ እና የሀኪም ክትትል አስፈላጊውን ምክርእ ንዲሰጥይደረጋል።

ምስጢርን ስለመጠበቅ

በጥናቱ ውስጥ የተሰበሰቡ ማናቸውም ግላዊ መረጃዎች ሚስጥራዊነታቸው የተጠበቀ ይሆናል።ከማንነቶ ጋር በቀጥታ ተያያዥነት ያላቸውን መረጃዎች በሙሉ በዋና ተመራማሪው ምስጢራዊ በሆነ የመረጃ ጥንቅር ዘዴ ከተቀየሩ በኃላ ለምርምር ሂደት የሚውል ይሆናል።

ከጥናቱ ስለ መውጣትና ስለማቋረጥ

ይህ ጥናት በፈቃደኝነት ላይ የተመሰረተ እንደሆነ መጠንጥናቱ ውስጥ አለመሳተፍ ናበማንኛውም ወቅት በፈቃድዎ ከጥናቱ መውጣት ይችላሉ።ከጥናቱ በመውጣት በህክምናዎ ላይ ምንምአይነትችግር አያመጣም።ከጥናቱ ጋር በተያያዘ ማንኛውም ጥያቄ ቢኖርዎ በሚከተለው አድራሻ ጥያቄዎን ማቅረብ ይችላሉ።

ዋና ተመራማሪ፡-ጀሚላ ሰይድ

አድራሻ ጅማ ዩኒቨርሲቲ ሜዲካል ላብራቶሪ ትምህርት ክፍል

ጅማ ኢትዮጵያ ስልክ፡**2519-17-00-41-85**

Annex 8 Unk aIbsa Odeeffannoo Qo’annoo

KaayyooQo’annichaa

Kaayyoon qo’annookanaa kanbu’uure ffaterakkoohir’ina dhiigaa dhukkubasammuu waliin walitti dhufeenya /hidhata/ inniqabu dhukkubasammuu ga’eessotaairratti qo’achuudhaa fi.Isinisqo’annoo kana irratti hirmaachuun keessanrakkoohir ’inni dhiigaa hubamtoota dhukkuba sammuu irrattidhibeeinniqaqqabsiisu /hordofsiisu/ to’achuudhaaf nu gargaara.

Qorannicha irratti hirmaachuu

Qo’annoo kana irrattihirmaa chuudhaa ffedhiiguutuuirratti kanhundaa’eedha. waanta’eefisduraandursaqo’annichairrattihirmaachuudhaaffedhiikeessankabajaanisingaafanna.
qo’annoo kana irratti hirmaachuu fyoohayyamtanda qiiqaashaniif gaaffiwwan jiranuuf deebiinuufkennitu. Dabalataan isqorannoowwan addaaddaati ifsaamuudadhiigaa kennuudhaa fhayyamamaata ’uukeessanisi ngaafanna.

Qo’annicha irratti hirmaachuu dhaan faayida aargamu

Saamuu dnidhiigaa laaboraatoorii dhaan yeroo qoratamubu’aan fayyadu yoo jiraate dookumantii waliinakka walqabatuu fi hordoffii ogeessa yaalaa gors abarbaachisaa akkakennutaa sifama**.**

Iccitii Eeguu

Qo’annichakeessatti odeeffannoowwan dhuun faasassaa baman kami yyuuiccitummaa nisaanii kaneegameta’a. odeeffannoo wwan kallattii dhaanmaa lummaa keessan waliinwalittihi dhamiinsa qabanu sirnaqindeessao deeffannoo qorataanol’aanaan kun qabu guutummaa nergajijjiiramaniiboodaadeemsaqorannootiifkanooluta’a.

Qo’annich akeessa abahuu fi addaankutuu

Qo’annoon kun fedhiimataa isaa irratti hundaa’eeqo’annicha keessatti hirmaachuu dhiisuu fi waqtii kamitti yyuufedhii keessaniin qo’annicha keessaa bahuudandeessu. qo’annicha keessaa bahuun yaalumsa keessan irratti rakkoo tokkollee hinfidu. Qo’annicha waliin walqabatee gaaffii yoo qabaattanteessoo kanattiaanee jiruungaa ffiikeessan dhiyeessuu dandeessu**.**

QorataaOl’aanaa – Jamiilaa Sayid

Teessoo:- Yuunivarsitii Jimmaakutaa Laaboraatoorii Meedikaalaa

Jimmaa, Itoophiyaa

Bilbila: 2519-17-00-41-85

Annex 9 CONSENT FORM ENGILISH VERSION

Code No……

I consent acceptance, has been explained to me in a language I understand on anemia and associated factors among psychiatric patient. I understand that prevalence of anemia and associated risk factor among psychiatric patients in our country is not done. For this reason, doingresearch on this tittle will be paramount important to decrease the complication.

Therefore I am informed about giving blood sample in no harm method and I will be interviewed for five minutes. More over all the data obtained will be kept strictly confidential. Anonymous testing will be undertaken, that is sample will be coded and result will not be identified by names in this paper and in the other reports; decline to answer the questions; the right not to participate or withdraw and decide not to participate has no influence on any services that I seek to get .Even I have been assured that I am benefited from cost free laboratory examination and based on the test result I will get the usual professional support from the assigned physician.

Therefore ,by understanding the objective of the consent ,I agreed to give blood sample for the stated purpose and I have no any objection if this sample also used for similar research in the future. Participating in this study is purely voluntarily; I am very happy and I have informed this to the consent offering personnel.

Researchers address Jemila Seid

Jimma Universty

Tel,09-17-00-41-85

Annex 10 ASSENT FORM IN ENGILISH

Purpose of the study a research is a way of finding out new information about something .I am doing a research to find anemia and its associated risk factors among psychiatric patients in JMC. We are asking adults to be part of the study. When you accept to be part of the study, we shall request you to respond to some questions concerning your health. A doctor will then examine and also draw small blood from you using a needle so that we can test it. During the process of drawing blood, you will feel some pain as the needle enters your body but this will not last long and after the needle is out you will not feel pain again. We shall also give you one container so that you put a small part of your stool. You are free to decline to participate in this study or with draw from the study at any time and this will not affect your management in any way. you are free to ask any questions now or if you get any questions later, you can call or your parent to call Jemila Seid 09-17-00-41-85

Annex 11 ASSENT FORM IN AMHARIC

የስምምነት ውል

የፕናቱ አላማ ስለ አንድ ነገር መረጃ ማግኘት ነው።ይህን ፕናት የማደርገው የአዕምሮ ህሙማን ላይ የደም ማነስ ዕና ምክንያቱን ስለሆነ ዕድም ከ 18 አመት በላይ የሆኑትን የፕናቱ አከል መሆንህን/ሽን አጠይቃለህ።ከፕሎስለ ጢናህ የሚመለክትህን/ሽን ፕያቅ ትመልስልናለህ/ሲልኛ ለሰ።በመቀጠልም ሀኪም ክየሃህ / ቡሃላ ለምርመራ የሚሆን ፕቂት የደም ናሙና መርፌ በመጠቀም ይወሰዳል።ይህ ትንሰ ህመም ይኖረዋል ግን አይቆይም።በተጨማሪም ትንሸ ሰገራ ለምርመራ ተመጣለህ/ጫለሽ።የናሙና □ክቃ □ሰ□ል።፤በማንኛውም ሰአትበጥናቱ ላይ ያሉትን ተሳትፎ ማቁዋረጥ ይችላለሉ።ይህም በርሶ የጥና ክትትል ላይ ምንም አይነት ተዕኖ አይኖረውም።ማንኛውንም ጥያቄበአሁነ ሰአት ወይም ቡሃላ መጠየቅ ከፈለጉ የጥናቱን ባለቤት ጀሚላን በስል□ ቁ□□ር 09 -17-00-41-85 ደውለው መጠየቅ ይትላሉ።

Declaration

I, the undersigned student, declared that this thesis is my own work and it has not been presented in other university, colleges or other institutions for similar degree or other purpose. Where other peopleworkhas been used, it has beencarefully acknowledged and referenced inaccordance with the requirements.

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